CETIFICATION

SDG No:	JC20768	Laboratory:	Accutest, New Jersey
Site:	BMS, Building 5 Area, PR Humacao, PR	Matrix:	Soil/Groundwater

SUMMARY: Groundwater and soil samples (Table 1) were collected on the BMSMC facility – Building 5 Area. The BMSMC facility is located in Humacao, PR. Samples were taken May 19-20, 2016 and were analyzed in Accutest Laboratory of Dayton, New Jersey for the ABN TCL Special List (1,4-Dioxane and Naphthalene were analyzed following the SIM technique); TCL pesticides list; and for low molecular weight alcohols (LMWA) the results were reported under SDG No.: JC20768. Results were validated using the latest validation guidelines (July, 2015) of the EPA Hazardous Waste Support Section. The analyses performed are shown in Table 1. Individual data review worksheets are enclosed for each target analyte group. The data sample organic data samples summary form shows for analytes results that were qualified.

In summary the results are valid and can be used for decision taking purposes.

Table 1. Samples analyzed and analysis performed

SAMPLE ID	SAMPLE DESCRIPTION	MATRIX	ANALYSIS PERFORMED
JC20768-1	RA1-GWS	Groundwater	ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); LMWA
JC20768-2	SB-104 (3-4)	Soil	ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); LMWA
JC20768-3	SB-104 (5-6)	Soil	ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); LMWA
JC20768-4	RA4 (5-6)	Soil	ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); TCL pesticides; LMWA
JC20768-5	RA4 (6-7)	Soil	ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); TCL pesticides; LMWA

Reviewer Name: Rafael Infante
Chemist License 1888

Signature: Rafael Infante

Date: June 17, 2016

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CB 86448

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Report of Analysis

Client Sample ID:	RA1-GWS		
Lab Sample ID:	JC20768-1	**Date Sampled:**	05/19/16
Matrix:	AQ - Ground Water	**Date Received:**	05/21/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2M84057A.D	1	05/23/16	AN	05/22/16	OP94110	E2M3698
Run #2							

	Initial Volume	Final Volume
Run #1	980 ml	1.0 ml
Run #2		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	5.1	0.84	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.1	0.91	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.0	1.3	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.1	2.5	ug/l	
51-28-5	2,4-Dinitrophenol	ND	10	1.6	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	5.1	1.3	ug/l	
95-48-7	2-Methylphenol	ND	2.0	0.91	ug/l	
	3&4-Methylphenol	ND	2.0	0.90	ug/l	
88-75-5	2-Nitrophenol	ND	5.1	0.98	ug/l	
100-02-7	4-Nitrophenol	ND	10	1.2	ug/l	
87-86-5	Pentachlorophenol	ND	5.1	1.4	ug/l	
108-95-2	Phenol	ND	2.0	0.40	ug/l	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	5.1	1.5	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.1	1.4	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.1	0.94	ug/l	
83-32-9	Acenaphthene	ND	1.0	0.19	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.14	ug/l	
98-86-2	Acetophenone	ND	2.0	0.21	ug/l	
120-12-7	Anthracene	ND	1.0	0.22	ug/l	
1912-24-9	Atrazine	ND	2.0	0.46	ug/l	
100-52-7	Benzaldehyde	ND	5.1	0.29	ug/l	
56-55-3	Benzo(a)anthracene	ND	1.0	0.21	ug/l	
50-32-8	Benzo(a)pyrene	ND	1.0	0.22	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	1.0	0.21	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	1.0	0.35	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	1.0	0.21	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.0	0.41	ug/l	
85-68-7	Butyl benzyl phthalate	ND	2.0	0.47	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.0	0.22	ug/l	
91-58-7	2-Chloronaphthalene	ND	2.0	0.24	ug/l	
106-47-8	4-Chloroaniline	ND	5.1	0.35	ug/l	
86-74-8	Carbazole	ND	1.0	0.23	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RA1-GWS		
Lab Sample ID:	JC20768-1	**Date Sampled:**	05/19/16
Matrix:	AQ - Ground Water	**Date Received:**	05/21/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	2.0	0.66	ug/l	
218-01-9	Chrysene	ND	1.0	0.18	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	2.0	0.28	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	2.0	0.25	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	2.0	0.41	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.0	0.37	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	1.0	0.56	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	1.0	0.49	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.0	0.52	ug/l	
123-91-1	1,4-Dioxane	10.1	1.0	0.67	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	1.0	0.34	ug/l	
132-64-9	Dibenzofuran	ND	5.1	0.22	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.0	0.51	ug/l	
117-84-0	Di-n-octyl phthalate	ND	2.0	0.24	ug/l	
84-66-2	Diethyl phthalate	ND	2.0	0.27	ug/l	
131-11-3	Dimethyl phthalate	ND	2.0	0.22	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.0	1.7	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.17	ug/l	
86-73-7	Fluorene	ND	1.0	0.17	ug/l	
118-74-1	Hexachlorobenzene	ND	1.0	0.33	ug/l	
87-68-3	Hexachlorobutadiene	ND	1.0	0.50	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	10	2.8	ug/l	
67-72-1	Hexachloroethane	ND	2.0	0.40	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.0	0.34	ug/l	
78-59-1	Isophorone	ND	2.0	0.28	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.27	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.21	ug/l	
88-74-4	2-Nitroaniline	ND	5.1	0.28	ug/l	
99-09-2	3-Nitroaniline	ND	5.1	0.39	ug/l	
100-01-6	4-Nitroaniline	ND	5.1	0.45	ug/l	
98-95-3	Nitrobenzene	ND	2.0	0.66	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.0	0.49	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.1	0.23	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.18	ug/l	
129-00-0	Pyrene	ND	1.0	0.22	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.0	0.38	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	51%		14-88%

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Report of Analysis

Client Sample ID:	RA1-GWS		
Lab Sample ID:	JC20768-1	**Date Sampled:**	05/19/16
Matrix:	AQ - Ground Water	**Date Received:**	05/21/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	35%		10-110%
118-79-6	2,4,6-Tribromophenol	90%		39-149%
4165-60-0	Nitrobenzene-d5	69%		32-128%
321-60-8	2-Fluorobiphenyl	69%		35-119%
1718-51-0	Terphenyl-d14	76%		10-126%

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Raw Data: 3M61598.D

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Report of Analysis

Client Sample ID:	RA1-GWS		
Lab Sample ID:	JC20768-1	**Date Sampled:**	05/19/16
Matrix:	AQ - Ground Water	**Date Received:**	05/21/16
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3M61598.D	1	05/24/16	LK	05/22/16	OP94110A	E3M2900
Run #2							

	Initial Volume	Final Volume
Run #1	980 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
91-20-3	Naphthalene	ND	0.10	0.030	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	75%		24-125%
321-60-8	2-Fluorobiphenyl	81%		19-127%
1718-51-0	Terphenyl-d14	86%		10-119%

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N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	RA1-GWS		
Lab Sample ID:	JC20768-1	**Date Sampled:**	05/19/16
Matrix:	AQ - Ground Water	**Date Received:**	05/21/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH105169.D	1	05/23/16	XPL	n/a	n/a	GGH5296
Run #2							

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	100	55	ug/l	
78-83-1	Isobutyl Alcohol	ND	100	36	ug/l	
67-63-0	Isopropyl Alcohol	ND	100	68	ug/l	
71-23-8	n-Propyl Alcohol	ND	100	43	ug/l	
71-36-3	n-Butyl Alcohol	ND	100	87	ug/l	
78-92-2	sec-Butyl Alcohol	ND	100	66	ug/l	
67-56-1	Methanol	ND	200	71	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	89%		56-145%
111-27-3	Hexanol	91%		56-145%

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N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	SB-104 (3-4)		
Lab Sample ID:	JC20768-2	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D SW846 3546	**Percent Solids:**	79.3
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5P28570.D	1	05/31/16	AD	05/25/16	OP94225	E5P1449
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	83	20	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	210	25	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	210	35	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	210	74	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	210	160	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	210	44	ug/kg	
95-48-7	2-Methylphenol	ND	83	26	ug/kg	
	3&4-Methylphenol	ND	83	34	ug/kg	
88-75-5	2-Nitrophenol	ND	210	27	ug/kg	
100-02-7	4-Nitrophenol	ND	410	110	ug/kg	
87-86-5	Pentachlorophenol	ND	210	39	ug/kg	
108-95-2	Phenol	ND	83	22	ug/kg	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	210	27	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	210	31	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	210	25	ug/kg	
83-32-9	Acenaphthene	ND	41	14	ug/kg	
208-96-8	Acenaphthylene	ND	41	21	ug/kg	
98-86-2	Acetophenone	ND	210	8.9	ug/kg	
120-12-7	Anthracene	ND	41	25	ug/kg	
1912-24-9	Atrazine	ND	83	18	ug/kg	
56-55-3	Benzo(a)anthracene	ND	41	12	ug/kg	
50-32-8	Benzo(a)pyrene	ND	41	19	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	41	18	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	41	21	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	41	19	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	83	16	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	83	10	ug/kg	
92-52-4	1,1'-Biphenyl	ND	83	5.7	ug/kg	
100-52-7	Benzaldehyde	ND	210	10	ug/kg	
91-58-7	2-Chloronaphthalene	ND	83	9.8	ug/kg	
106-47-8	4-Chloroaniline	ND	210	15	ug/kg	
86-74-8	Carbazole	ND	83	6.0	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SB-104 (3-4)		
Lab Sample ID:	JC20768-2	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D SW846 3546	**Percent Solids:**	79.3
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	83	16	ug/kg	
218-01-9	Chrysene	ND	41	13	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	83	8.8	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	83	18	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	83	15	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	83	13	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	41	13	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	41	21	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	83	34	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	41	18	ug/kg	
132-64-9	Dibenzofuran	ND	83	17	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	83	6.7	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	83	10	ug/kg	
84-66-2	Diethyl phthalate	ND	83	8.8	ug/kg	
131-11-3	Dimethyl phthalate	ND	83	7.4	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	83	9.7	ug/kg	
206-44-0	Fluoranthene	ND	41	18	ug/kg	
86-73-7	Fluorene	ND	41	19	ug/kg	
118-74-1	Hexachlorobenzene	ND	83	10	ug/kg	
87-68-3	Hexachlorobutadiene	ND	41	17	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	410	16	ug/kg	
67-72-1	Hexachloroethane	ND	210	20	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	41	19	ug/kg	
78-59-1	Isophorone	ND	83	8.8	ug/kg	
90-12-0	1-Methylnaphthalene	ND	83	8.1	ug/kg	
91-57-6	2-Methylnaphthalene	ND	83	9.3	ug/kg	
88-74-4	2-Nitroaniline	ND	210	9.8	ug/kg	
99-09-2	3-Nitroaniline	ND	210	10	ug/kg	
100-01-6	4-Nitroaniline	ND	210	11	ug/kg	
98-95-3	Nitrobenzene	ND	83	16	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	83	12	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	210	15	ug/kg	
85-01-8	Phenanthrene	ND	41	14	ug/kg	
129-00-0	Pyrene	ND	41	13	ug/kg	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	210	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	62%		30-106%
4165-62-2	Phenol-d5	61%		30-106%

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N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SB-104 (3-4)		
Lab Sample ID:	JC20768-2	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D SW846 3546	**Percent Solids:**	79.3
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
118-79-6	2,4,6-Tribromophenol	76%		24-140%
4165-60-0	Nitrobenzene-d5	64%		26-122%
321-60-8	2-Fluorobiphenyl	65%		36-112%
1718-51-0	Terphenyl-d14	67%		36-132%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	SB-104 (3-4)		
Lab Sample ID:	JC20768-2	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D BY SIM SW846 3546	**Percent Solids:**	79.3
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4M65734.D	1	06/03/16	LK	05/25/16	OP94225A	E4M2949
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane [a]	ND	4.1	0.83	ug/kg	
91-20-3	Naphthalene	ND	4.1	0.50	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	76%		15-138%
321-60-8	2-Fluorobiphenyl	80%		12-148%
1718-51-0	Terphenyl-d14	88%		10-157%

(a) Not accredited for this compound at the time of analysis, but all method requirements were followed.

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SGS Accutest

Report of Analysis

Client Sample ID:	SB-104 (3-4)		
Lab Sample ID:	JC20768-2	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	79.3
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH105189.D	1	05/24/16	XPL	n/a	n/a	GGH5298
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	130	87	ug/kg	
78-83-1	Isobutyl Alcohol	ND	130	74	ug/kg	
67-63-0	Isopropyl Alcohol	ND	130	72	ug/kg	
71-23-8	n-Propyl Alcohol	ND	130	51	ug/kg	
71-36-3	n-Butyl Alcohol	ND	130	68	ug/kg	
78-92-2	sec-Butyl Alcohol	ND	130	67	ug/kg	
67-56-1	Methanol	ND	250	60	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	105%		52-141%
111-27-3	Hexanol	109%		52-141%

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LIC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	SB-104 (5-6)		
Lab Sample ID:	JC20768-3	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D SW846 3546	**Percent Solids:**	87.8
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5P28571.D	1	05/31/16	AD	05/25/16	OP94225	E5P1449
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	75	19	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	23	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	32	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	67	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	190	140	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	190	40	ug/kg	
95-48-7	2-Methylphenol	ND	75	24	ug/kg	
	3&4-Methylphenol	ND	75	31	ug/kg	
88-75-5	2-Nitrophenol	ND	190	25	ug/kg	
100-02-7	4-Nitrophenol	ND	380	100	ug/kg	
87-86-5	Pentachlorophenol	ND	190	35	ug/kg	
108-95-2	Phenol	ND	75	20	ug/kg	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	190	25	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	28	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	22	ug/kg	
83-32-9	Acenaphthene	ND	38	13	ug/kg	
208-96-8	Acenaphthylene	ND	38	19	ug/kg	
98-86-2	Acetophenone	ND	190	8.1	ug/kg	
120-12-7	Anthracene	ND	38	23	ug/kg	
1912-24-9	Atrazine	ND	75	16	ug/kg	
56-55-3	Benzo(a)anthracene	145	38	11	ug/kg	
50-32-8	Benzo(a)pyrene	74.7	38	17	ug/kg	
205-99-2	Benzo(b)fluoranthene	111	38	17	ug/kg	
191-24-2	Benzo(g,h,i)perylene	26.0	38	19	ug/kg	J
207-08-9	Benzo(k)fluoranthene	41.6	38	18	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	75	15	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	75	9.2	ug/kg	
92-52-4	1,1'-Biphenyl	ND	75	5.2	ug/kg	
100-52-7	Benzaldehyde	ND	190	9.4	ug/kg	
91-58-7	2-Chloronaphthalene	ND	75	9.0	ug/kg	
106-47-8	4-Chloroaniline	ND	190	14	ug/kg	
86-74-8	Carbazole	ND	75	5.5	ug/kg	

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Report of Analysis

Client Sample ID:	SB-104 (5-6)		
Lab Sample ID:	JC20768-3	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D SW846 3546	**Percent Solids:**	87.8
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	75	15	ug/kg	
218-01-9	Chrysene	83.7	38	12	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	75	8.1	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	75	16	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	75	14	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	75	12	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	38	12	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	38	19	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	75	31	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	38	17	ug/kg	
132-64-9	Dibenzofuran	ND	75	15	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	75	6.1	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	75	9.4	ug/kg	
84-66-2	Diethyl phthalate	ND	75	8.0	ug/kg	
131-11-3	Dimethyl phthalate	ND	75	6.7	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	75	8.8	ug/kg	
206-44-0	Fluoranthene	1010	38	17	ug/kg	
86-73-7	Fluorene	ND	38	17	ug/kg	
118-74-1	Hexachlorobenzene	ND	75	9.5	ug/kg	
87-68-3	Hexachlorobutadiene	ND	38	15	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	380	15	ug/kg	
67-72-1	Hexachloroethane	ND	190	19	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	34.3	38	18	ug/kg	J
78-59-1	Isophorone	ND	75	8.1	ug/kg	
90-12-0	1-Methylnaphthalene	ND	75	7.4	ug/kg	
91-57-6	2-Methylnaphthalene	ND	75	8.5	ug/kg	
88-74-4	2-Nitroaniline	ND	190	8.9	ug/kg	
99-09-2	3-Nitroaniline	ND	190	9.4	ug/kg	
100-01-6	4-Nitroaniline	ND	190	9.8	ug/kg	
98-95-3	Nitrobenzene	ND	75	15	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	75	11	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	14	ug/kg	
85-01-8	Phenanthrene	ND	38	13	ug/kg	
129-00-0	Pyrene	672	38	12	ug/kg	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	190	9.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	60%		30-106%
4165-62-2	Phenol-d5	59%		30-106%

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Report of Analysis

Client Sample ID:	SB-104 (5-6)		
Lab Sample ID:	JC20768-3	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D SW846 3546	**Percent Solids:**	87.8
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
118-79-6	2,4,6-Tribromophenol	73%		24-140%
4165-60-0	Nitrobenzene-d5	69%		26-122%
321-60-8	2-Fluorobiphenyl	68%		36-112%
1718-51-0	Terphenyl-d14	66%		36-132%

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SGS Accutest

Report of Analysis

Client Sample ID:	SB-104 (5-6)		
Lab Sample ID:	JC20768-3	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D BY SIM SW846 3546	**Percent Solids:**	87.8
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4M65735.D	1	06/03/16	LK	05/25/16	OP94225A	E4M2949
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane [a]	ND	3.8	0.76	ug/kg	
91-20-3	Naphthalene	ND	3.8	0.46	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	49%		15-138%
321-60-8	2-Fluorobiphenyl	70%		12-148%
1718-51-0	Terphenyl-d14	82%		10-157%

(a) Not accredited for this compound at the time of analysis, but all method requirements were followed.

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SGS Accutest

Report of Analysis

Client Sample ID:	SB-104 (5-6)		
Lab Sample ID:	JC20768-3	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	87.8
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH105192.D	1	05/24/16	XPL	n/a	n/a	GGH5298
Run #2							

	Initial Weight
Run #1	5.2 g
Run #2	

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	110	76	ug/kg	
78-83-1	Isobutyl Alcohol	ND	110	64	ug/kg	
67-63-0	Isopropyl Alcohol	ND	110	63	ug/kg	
71-23-8	n-Propyl Alcohol	ND	110	44	ug/kg	
71-36-3	n-Butyl Alcohol	ND	110	59	ug/kg	
78-92-2	sec-Butyl Alcohol	ND	110	58	ug/kg	
67-56-1	Methanol	ND	220	52	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	88%		52-141%
111-27-3	Hexanol	93%		52-141%

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J = Indicates an estimated value
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N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	RA4 (5-6)		
Lab Sample ID:	JC20768-4	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D SW846 3546	**Percent Solids:**	81.6
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5P28572.D	1	05/31/16	AD	05/25/16	OP94225	E5P1449
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	80	20	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	24	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	34	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	71	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	200	150	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	200	43	ug/kg	
95-48-7	2-Methylphenol	ND	80	26	ug/kg	
	3&4-Methylphenol	ND	80	33	ug/kg	
88-75-5	2-Nitrophenol	ND	200	26	ug/kg	
100-02-7	4-Nitrophenol	ND	400	110	ug/kg	
87-86-5	Pentachlorophenol	ND	200	37	ug/kg	
108-95-2	Phenol	ND	80	21	ug/kg	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	200	26	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	30	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	24	ug/kg	
83-32-9	Acenaphthene	ND	40	14	ug/kg	
208-96-8	Acenaphthylene	ND	40	20	ug/kg	
98-86-2	Acetophenone	ND	200	8.6	ug/kg	
120-12-7	Anthracene	ND	40	24	ug/kg	
1912-24-9	Atrazine	ND	80	17	ug/kg	
56-55-3	Benzo(a)anthracene	ND	40	11	ug/kg	
50-32-8	Benzo(a)pyrene	ND	40	18	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	40	18	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	40	20	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	40	19	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	80	15	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	80	9.7	ug/kg	
92-52-4	1,1'-Biphenyl	ND	80	5.5	ug/kg	
100-52-7	Benzaldehyde	ND	200	9.9	ug/kg	
91-58-7	2-Chloronaphthalene	ND	80	9.5	ug/kg	
106-47-8	4-Chloroaniline	ND	200	14	ug/kg	
86-74-8	Carbazole	ND	80	5.8	ug/kg	

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Report of Analysis

Client Sample ID:	RA4 (5-6)		
Lab Sample ID:	JC20768-4	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D SW846 3546	**Percent Solids:**	81.6
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	80	16	ug/kg	
218-01-9	Chrysene	ND	40	13	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	80	8.5	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	80	17	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	80	14	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	80	13	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	40	12	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	40	20	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	80	33	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	40	18	ug/kg	
132-64-9	Dibenzofuran	ND	80	16	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	80	6.5	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	80	9.9	ug/kg	
84-66-2	Diethyl phthalate	ND	80	8.5	ug/kg	
131-11-3	Dimethyl phthalate	ND	80	7.1	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	142	80	9.3	ug/kg	
206-44-0	Fluoranthene	ND	40	18	ug/kg	
86-73-7	Fluorene	ND	40	18	ug/kg	
118-74-1	Hexachlorobenzene	ND	80	10	ug/kg	
87-68-3	Hexachlorobutadiene	ND	40	16	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	400	16	ug/kg	
67-72-1	Hexachloroethane	ND	200	20	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	40	19	ug/kg	
78-59-1	Isophorone	ND	80	8.5	ug/kg	
90-12-0	1-Methylnaphthalene	ND	80	7.8	ug/kg	
91-57-6	2-Methylnaphthalene	ND	80	9.0	ug/kg	
88-74-4	2-Nitroaniline	ND	200	9.4	ug/kg	
99-09-2	3-Nitroaniline	ND	200	10	ug/kg	
100-01-6	4-Nitroaniline	ND	200	10	ug/kg	
98-95-3	Nitrobenzene	ND	80	15	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	80	12	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	15	ug/kg	
85-01-8	Phenanthrene	ND	40	13	ug/kg	
129-00-0	Pyrene	ND	40	13	ug/kg	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	200	10	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	62%		30-106%
4165-62-2	Phenol-d5	59%		30-106%

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Report of Analysis

Client Sample ID:	RA4 (5-6)		
Lab Sample ID:	JC20768-4	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D SW846 3546	**Percent Solids:**	81.6
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
118-79-6	2,4,6-Tribromophenol	78%		24-140%
4165-60-0	Nitrobenzene-d5	63%		26-122%
321-60-8	2-Fluorobiphenyl	66%		36-112%
1718-51-0	Terphenyl-d14	68%		36-132%

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SGS Accutest

Report of Analysis

Client Sample ID:	RA4 (5-6)		
Lab Sample ID:	JC20768-4	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D BY SIM SW846 3546	**Percent Solids:**	81.6
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4M65736.D	1	06/03/16	LK	05/25/16	OP94225A	E4M2949
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane [a]	ND	4.0	0.80	ug/kg	
91-20-3	Naphthalene	ND	4.0	0.49	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	67%		15-138%
321-60-8	2-Fluorobiphenyl	88%		12-148%
1718-51-0	Terphenyl-d14	80%		10-157%

(a) Not accredited for this compound at the time of analysis, but all method requirements were followed.

COLEGIO LIBRE ASOCIADO DE PUERTO RICO
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SGS Accutest

Report of Analysis

Client Sample ID:	RA4 (5-6)		
Lab Sample ID:	JC20768-4	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	81.6
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH105193.D	1	05/24/16	XPL	n/a	n/a	GGH5298
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	120	85	ug/kg	
78-83-1	Isobutyl Alcohol	ND	120	72	ug/kg	
67-63-0	Isopropyl Alcohol	ND	120	70	ug/kg	
71-23-8	n-Propyl Alcohol	ND	120	49	ug/kg	
71-36-3	n-Butyl Alcohol	ND	120	67	ug/kg	
78-92-2	sec-Butyl Alcohol	ND	120	65	ug/kg	
67-56-1	Methanol	ND	250	59	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	106%		52-141%
111-27-3	Hexanol	111%		52-141%

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SGS Accutest

Report of Analysis

Client Sample ID:	RA4 (5-6)		
Lab Sample ID:	JC20768-4	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8081B SW846 3546	**Percent Solids:**	81.6
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6G35483.D	1	05/24/16	DS	05/24/16	OP94185	G6G1018
Run #2							

	Initial Weight	Final Volume
Run #1	16.6 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.74	0.66	ug/kg	
319-84-6	alpha-BHC	ND	0.74	0.49	ug/kg	
319-85-7	beta-BHC	ND	0.74	0.46	ug/kg	
319-86-8	delta-BHC	ND	0.74	0.29	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	0.74	0.34	ug/kg	
5103-71-9	alpha-Chlordane	ND	0.74	0.39	ug/kg	
5103-74-2	gamma-Chlordane	ND	0.74	0.56	ug/kg	
60-57-1	Dieldrin	ND	0.74	0.58	ug/kg	
72-54-8	4,4'-DDD	ND	0.74	0.27	ug/kg	
72-55-9	4,4'-DDE	ND	0.74	0.25	ug/kg	
50-29-3	4,4'-DDT	ND	0.74	0.28	ug/kg	
72-20-8	Endrin	ND	0.74	0.26	ug/kg	
1031-07-8	Endosulfan sulfate	ND	0.74	0.42	ug/kg	
7421-93-4	Endrin aldehyde	ND	0.74	0.55	ug/kg	
959-98-8	Endosulfan-I	ND	0.74	0.24	ug/kg	
33213-65-9	Endosulfan-II	ND	0.74	0.70	ug/kg	
76-44-8	Heptachlor	ND	0.74	0.61	ug/kg	
1024-57-3	Heptachlor epoxide	ND	0.74	0.30	ug/kg	
72-43-5	Methoxychlor	ND	1.5	0.41	ug/kg	
53494-70-5	Endrin ketone	ND	0.74	0.39	ug/kg	
8001-35-2	Toxaphene	ND	18	13	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	81%		24-136%
877-09-8	Tetrachloro-m-xylene	88%		24-136%
2051-24-3	Decachlorobiphenyl	80%		10-153%
2051-24-3	Decachlorobiphenyl	94%		10-153%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	RA4 (6-7)		
Lab Sample ID:	JC20768-5	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D SW846 3546	**Percent Solids:**	79.3
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5P28573.D	1	05/31/16	AD	05/25/16	OP94225	E5P1449
Run #2							

	Initial Weight	Final Volume
Run #1	31.5 g	1.0 ml
Run #2		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	80	20	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	25	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	34	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	71	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	200	150	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	200	43	ug/kg	
95-48-7	2-Methylphenol	ND	80	26	ug/kg	
	3&4-Methylphenol	ND	80	33	ug/kg	
88-75-5	2-Nitrophenol	ND	200	26	ug/kg	
100-02-7	4-Nitrophenol	ND	400	110	ug/kg	
87-86-5	Pentachlorophenol	ND	200	38	ug/kg	
108-95-2	Phenol	ND	80	21	ug/kg	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	200	27	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	30	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	24	ug/kg	
83-32-9	Acenaphthene	ND	40	14	ug/kg	
208-96-8	Acenaphthylene	ND	40	20	ug/kg	
98-86-2	Acetophenone	ND	200	8.6	ug/kg	
120-12-7	Anthracene	ND	40	25	ug/kg	
1912-24-9	Atrazine	ND	80	17	ug/kg	
56-55-3	Benzo(a)anthracene	ND	40	11	ug/kg	
50-32-8	Benzo(a)pyrene	ND	40	18	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	40	18	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	40	20	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	40	19	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	80	15	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	80	9.8	ug/kg	
92-52-4	1,1'-Biphenyl	ND	80	5.5	ug/kg	
100-52-7	Benzaldehyde	ND	200	9.9	ug/kg	
91-58-7	2-Chloronaphthalene	ND	80	9.5	ug/kg	
106-47-8	4-Chloroaniline	ND	200	14	ug/kg	
86-74-8	Carbazole	ND	80	5.8	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RA4 (6-7)		
Lab Sample ID:	JC20768-5	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D SW846 3546	**Percent Solids:**	79.3
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	80	16	ug/kg	
218-01-9	Chrysene	ND	40	13	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	80	8.6	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	80	17	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	80	14	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	80	13	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	40	12	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	40	20	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	80	33	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	40	18	ug/kg	
132-64-9	Dibenzofuran	ND	80	16	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	80	6.5	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	80	10	ug/kg	
84-66-2	Diethyl phthalate	ND	80	8.5	ug/kg	
131-11-3	Dimethyl phthalate	ND	80	7.1	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	80	9.4	ug/kg	
206-44-0	Fluoranthene	ND	40	18	ug/kg	
86-73-7	Fluorene	ND	40	18	ug/kg	
118-74-1	Hexachlorobenzene	ND	80	10	ug/kg	
87-68-3	Hexachlorobutadiene	ND	40	16	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	400	16	ug/kg	
67-72-1	Hexachloroethane	ND	200	20	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	40	19	ug/kg	
78-59-1	Isophorone	ND	80	8.6	ug/kg	
90-12-0	1-Methylnaphthalene	ND	80	7.8	ug/kg	
91-57-6	2-Methylnaphthalene	ND	80	9.0	ug/kg	
88-74-4	2-Nitroaniline	ND	200	9.4	ug/kg	
99-09-2	3-Nitroaniline	ND	200	10	ug/kg	
100-01-6	4-Nitroaniline	ND	200	10	ug/kg	
98-95-3	Nitrobenzene	ND	80	15	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	80	12	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	15	ug/kg	
85-01-8	Phenanthrene	ND	40	13	ug/kg	
129-00-0	Pyrene	ND	40	13	ug/kg	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	200	10	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	56%		30-106%
4165-62-2	Phenol-d5	54%		30-106%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RA4 (6-7)		
Lab Sample ID:	JC20768-5	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D SW846 3546	**Percent Solids:**	79.3
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
118-79-6	2,4,6-Tribromophenol	67%		24-140%
4165-60-0	Nitrobenzene-d5	59%		26-122%
321-60-8	2-Fluorobiphenyl	60%		36-112%
1718-51-0	Terphenyl-d14	57%		36-132%

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Rafael Infante Méndez
1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	RA4 (6-7)		
Lab Sample ID:	JC20768-5	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8270D BY SIM SW846 3546	**Percent Solids:**	79.3
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4M65737.D	1	06/03/16	LK	05/25/16	OP94225A	E4M2949
Run #2							

	Initial Weight	Final Volume
Run #1	31.5 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane [a]	ND	4.0	0.80	ug/kg	
91-20-3	Naphthalene	ND	4.0	0.49	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	52%		15-138%
321-60-8	2-Fluorobiphenyl	71%		12-148%
1718-51-0	Terphenyl-d14	72%		10-157%

(a) Not accredited for this compound at the time of analysis, but all method requirements were followed.

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ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	RA4 (6-7)				
Lab Sample ID:	JC20768-5		**Date Sampled:**	05/20/16	
Matrix:	SO - Soil		**Date Received:**	05/21/16	
Method:	SW846-8015C (DAI)		**Percent Solids:**	79.3	
Project:	BMSMC, Building 5 Area, PR				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH105194.D	1	05/24/16	XPL	n/a	n/a	GGH5298
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	130	87	ug/kg	
78-83-1	Isobutyl Alcohol	ND	130	74	ug/kg	
67-63-0	Isopropyl Alcohol	ND	130	72	ug/kg	
71-23-8	n-Propyl Alcohol	ND	130	51	ug/kg	
71-36-3	n-Butyl Alcohol	ND	130	68	ug/kg	
78-92-2	sec-Butyl Alcohol	ND	130	67	ug/kg	
67-56-1	Methanol	ND	250	60	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	102%		52-141%
111-27-3	Hexanol	111%		52-141%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 6G35484.D

SGS Accutest

Report of Analysis

Client Sample ID:	RA4 (6-7)		
Lab Sample ID:	JC20768-5	**Date Sampled:**	05/20/16
Matrix:	SO - Soil	**Date Received:**	05/21/16
Method:	SW846 8081B SW846 3546	**Percent Solids:**	79.3
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6G35484.D	1	05/24/16	DS	05/24/16	OP94185	G6G1018
Run #2							

	Initial Weight	Final Volume
Run #1	16.0 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.79	0.70	ug/kg	
319-84-6	alpha-BHC	ND	0.79	0.53	ug/kg	
319-85-7	beta-BHC	ND	0.79	0.49	ug/kg	
319-86-8	delta-BHC	ND	0.79	0.31	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	0.79	0.36	ug/kg	
5103-71-9	alpha-Chlordane	ND	0.79	0.42	ug/kg	
5103-74-2	gamma-Chlordane	ND	0.79	0.60	ug/kg	
60-57-1	Dieldrin	ND	0.79	0.62	ug/kg	
72-54-8	4,4'-DDD	ND	0.79	0.29	ug/kg	
72-55-9	4,4'-DDE	ND	0.79	0.26	ug/kg	
50-29-3	4,4'-DDT	ND	0.79	0.30	ug/kg	
72-20-8	Endrin	ND	0.79	0.28	ug/kg	
1031-07-8	Endosulfan sulfate	ND	0.79	0.45	ug/kg	
7421-93-4	Endrin aldehyde	ND	0.79	0.59	ug/kg	
959-98-8	Endosulfan-I	ND	0.79	0.26	ug/kg	
33213-65-9	Endosulfan-II	ND	0.79	0.75	ug/kg	
76-44-8	Heptachlor	ND	0.79	0.65	ug/kg	
1024-57-3	Heptachlor epoxide	ND	0.79	0.33	ug/kg	
72-43-5	Methoxychlor	ND	1.6	0.44	ug/kg	
53494-70-5	Endrin ketone	ND	0.79	0.41	ug/kg	
8001-35-2	Toxaphene	ND	20	14	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	89%		24-136%
877-09-8	Tetrachloro-m-xylene	98%		24-136%
2051-24-3	Decachlorobiphenyl	75%		10-153%
2051-24-3	Decachlorobiphenyl	97%		10-153%

ND = Not detected MDL = Method Detection Limit
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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SO
CW

SGS ACCUTEST – NJ

CHAIN OF CUSTODY

PAGE 1 OF 1

SGS Accutest - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX. 732-329-3499/3480
www.accutest.com

801219535857

SGS Accutest Quote #: JC 20768

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Company Name	Project Name	Billing Information (if different from Report to)
Anderson Mulholland Assoc. Inc.	BMS Release Assessment	
Address: 2 700 Westchester	Street:	Company Name:
City: Purchase State: NY Zip:	City: Humacao State: PR	Street Address:
Project Contact: Terry Taylor E-mail:	Project #:	City State Zip:
Phone #: 914-251-0400 Fax #:	Client Purchase Order #:	Attention:
Sampler(s) Name(s): T. Taylor, D. Lindstrand Phone #:	Project Manager:	

Accutest Lab ID	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved Bottles: HCl	HNO3	H2SO4	NaOH	DI Water	MEOH	UNPRES	SVOC - Method 8270D	LMA - Method 8015B	Pesticides - Method 8081B	14 Dioxane + Naphthalene by Method 8270D SIM	LAB USE ONLY
1	RA1-GWS		05/20/16	1125	TT	GW	5	3			2				X	X		X	EB
2	SB-104 (3-4)		05/20/16	1145	TT	SO	2				2				X	X		X	V181
3	SB-104 (5-6)		05/20/16	1205	TT	SO	2				2				X	X		X	FS3
4	RA1 (5-6)		05/20/16	1440	TT	SO	2				2				X	X	X	X	
5	RA1 (6-7)		05/20/16	1520	TT	SO	2				2				X	X	X	X	

INITIAL ASSESSMENT: RA
LABEL VERIFICATION: TP

Turnaround Time (Business days)
- [X] Std. 10 Business Days For Soil Samples
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [X] 1 Day RUSH For aqueous samples
- [ ] other

Approved By (SGS Accutest PM) / Date:

Data Deliverable Information
- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [X] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only, Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions:
Add to Report: 1-methyl naphthalene with SVOC Method 8270D

Sample Inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by	Date Time	Received By	Relinquished By	Date Time	Received By
1	[signature]	05/20/16 1700	1 FedEx	2 FEDEX	9.35 5-21-16	3 TP
2				4		4
3	Relinquished by Sampler:	Date Time:	Received By: 3			
4						
5	Relinquished by:	Date Time:	Received By: 5	Cooler Temp: 3.58	Blank: [ ] Not Blank: [ ]	Preserved where applicable: [ ] On Ice: [ ] Cooler Temp: 5.4° TP

JC20768: Chain of Custody
Page 1 of 2

EXECUTIVE NARRATIVE

SDG No:	JC20768	Laboratory:	Accutest, New Jersey
Analysis:	SW846-8270D	Number of Samples:	5
Location:	BMSMC, Building 5 Area Humacao, PR		

SUMMARY: Five (5) samples were analyzed for the ABN TCL list following method SW846-8270D; Naphthalene and 1,4-Dioxane were also analyzed by SW846-8270D using the selective ion monitoring (SIM) technique. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: EPA Hazardous Waste Support Section, SOP HW-35A, July 2015 –Revision 0. *Semivolatile Data Validation*. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: **None**
Major: **None**
Minor: **None**

Critical findings: **None**
Major findings: **None**
Minor findings:

1. Initial and continuing calibration verifications meet the required criteria. Analytes not meeting the method % difference criteria meet the guidance document performance criteria for continuing calibration verification of ± 25 or 40 %, no action taken.

4,6-dinitro-o-cresol did not meet the % difference continuing calibration criteria. Results for this analyte qualified (UJ) in samples JC20768-2; -3; -4; -5.

No closing calibration verification included in data package. No action taken, professional judgment.

2. MSMSD % recovery outside the lower control limits for hexachlorocyclopentadiene in sample JC20784-2MS/MSD. Non-detects are rejected (R).

MS/MSD % recoveries outside the lower control limits for 1,4-dioxane in sample JC20768-3MS/MSD. Non-detects are rejected (R).

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: Rafael Infante

Date: June 17, 2016

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC20768-1
Sample location: BMSMC Building 5 Area
Sampling date: 5/19/2016
Matrix: Groundwater

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	5.1	ug/l	1	-	U	Yes
4-Chloro-3-methyl phenol	5.1	ug/l	1	-	U	Yes
2,4-Dichlorophenol	2.0	ug/l	1	-	U	Yes
2,4-Dimethylphenol	5.1	ug/l	1	-	U	Yes
2,4-Dinitrophenol	10	ug/l	1	-	U	Yes
4,6-Dinitro-o-cresol	5.1	ug/l	1	-	U	Yes
2-Methylphenol	2.0	ug/l	1	-	U	Yes
3&4-Methylphenol	2.0	ug/l	1	-	U	Yes
2-Nitrophenol	5.1	ug/l	1	-	U	Yes
4-Nitrophenol	10	ug/l	1	-	U	Yes
Pentachlorophenol	5.1	ug/l	1	-	U	Yes
Phenol	2.0	ug/l	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	5.1	ug/l	1	-	U	Yes
2,4,5-Trichlorophenol	5.1	ug/l	1	-	U	Yes
2,4,6-Trichlorophenol	5.1	ug/l	1	-	U	Yes
Acenaphthene	1.0	ug/l	1	-	U	Yes
Acenaphthylene	1.0	ug/l	1	-	U	Yes
Acetophenone	2.0	ug/l	1	-	U	Yes
Anthracene	1.0	ug/l	1	-	U	Yes
Atrazine	2.0	ug/l	1	-	U	Yes
Benzaldehyde	5.1	ug/l	1	-	U	Yes
Benzo(a)anthracene	1.0	ug/l	1	-	U	Yes
Benzo(a)pyrene	1.0	ug/l	1	-	U	Yes
Benzo(b)fluoranthene	1.0	ug/l	1	-	U	Yes
Benzo(g,h,i)perylene	1.0	ug/l	1	-	U	Yes
Benzo(k)fluoranthene	1.0	ug/l	1	-	U	Yes
4-Bromophenyl phenyl ether	1.0	ug/l	1	-	U	Yes
Butyl benzyl phthalate	2.0	ug/l	1	-	U	Yes
1,1'-Biphenyl	1.0	ug/l	1	-	U	Yes
2-Chloronaphthalene	2.0	ug/l	1	-	U	Yes
4-Chloroaniline	5.1	ug/l	1	-	U	Yes
Carbazole	1.0	ug/l	1	-	U	Yes
Caprolactam	2.0	ug/l	1	-	U	Yes
Chrysene	1.0	ug/l	1	-	U	Yes
bis(2-Chloroethoxy)methane	2.0	ug/l	1	-	U	Yes
bis(2-Chloroethyl)ether	2.0	ug/l	1	-	U	Yes

bis(2-Chloroisopropyl)ether	2.0	ug/l	1	-	U	Yes
4-Chlorophenyl phenyl ether	2.0	ug/l	1	-	U	Yes
2,4-Dinitrotoluene	1.0	ug/l	1	-	U	Yes
2,6-Dinitrotoluene	1.0	ug/l	1	-	U	Yes
3,3'-Dichlorobenzidine	2.0	ug/l	1	-	U	Yes
1,4-Dioxane	10.1	ug/l	1	-	-	Yes
Dibenzo(a,h)anthracene	1.0	ug/l	1	-	U	Yes
Dibenzofuran	5.1	ug/l	1	-	U	Yes
Di-n-butyl phthalate	2.0	ug/l	1	-	U	Yes
Di-n-octyl phthalate	2.0	ug/l	1	-	U	Yes
Diethyl phthalate	2.0	ug/l	1	-	U	Yes
Dimethyl phthalate	2.0	ug/l	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	2.0	ug/l	1	-	U	Yes
Fluoranthene	1.0	ug/l	1	-	U	Yes
Fluorene	1.0	ug/l	1	-	U	Yes
Hexachlorobenzene	1.0	ug/l	1	-	U	Yes
Hexachlorobutadiene	1.0	ug/l	1	-	U	Yes
Hexachlorocyclopentadiene	13	ug/l	1	-	U	Yes
Hexachloroethane	2.0	ug/l	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	1.0	ug/l	1	-	U	Yes
Isophorone	2.0	ug/l	1	-	U	Yes
1-Methylnaphthalene	1.0	ug/l	1	-	U	Yes
2-Methylnaphthalene	1.0	ug/l	1	-	U	Yes
2-Nitroaniline	5.1	ug/l	1	-	U	Yes
3-Nitroaniline	5.1	ug/l	1	-	U	Yes
4-Nitroaniline	5.1	ug/l	1	-	U	Yes
Nitrobenzene	2.0	ug/l	1	-	U	Yes
N-Nitroso-di-n-propylamine	2.0	ug/l	1	-	U	Yes
Nitrosodiphenylamine	5.1	ug/l	1	-	U	Yes
Phenanthrene	1.0	ug/l	1	-	U	Yes
Pyrene	1.0	ug/l	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	2.0	ug/l	1	-	U	Yes
	METHOD: 8270D (SIM)					
Naphthalene	0.10	ug/l	1	-	U	Yes

Sample ID: JC20768-2
Sample location: BMSMC Building 5 Area
Sampling date: 5/20/2016
Matrix: Soil

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	83	ug/kg	1	-	U	Yes
4-Chloro-3-methyl phenol	210	ug/kg	1	-	U	Yes
2,4-Dichlorophenol	210	ug/kg	1	-	U	Yes
2,4-Dimethylphenol	210	ug/kg	1	-	U	Yes
2,4-Dinitrophenol	210	ug/kg	1	-	U	Yes
4,6-Dinitro-o-cresol	210	ug/kg	1	-	UJ	Yes
2-Methylphenol	83	ug/kg	1	-	U	Yes
3&4-Methylphenol	83	ug/kg	1	-	U	Yes
2-Nitrophenol	210	ug/kg	1	-	U	Yes
4-Nitrophenol	410	ug/kg	1	-	U	Yes
Pentachlorophenol	210	ug/kg	1	-	U	Yes
Phenol	83	ug/kg	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	210	ug/kg	1	-	U	Yes
2,4,5-Trichlorophenol	210	ug/kg	1	-	U	Yes
2,4,6-Trichlorophenol	210	ug/kg	1	-	U	Yes
Acenaphthene	41	ug/kg	1	-	U	Yes
Acenaphthylene	41	ug/kg	1	-	U	Yes
Acetophenone	210	ug/kg	1	-	U	Yes
Anthracene	41	ug/kg	1	-	U	Yes
Atrazine	83	ug/kg	1	-	U	Yes
Benzo(a)anthracene	41	ug/kg	1	-	U	Yes
Benzo(a)pyrene	41	ug/kg	1	-	U	Yes
Benzo(b)fluoranthene	41	ug/kg	1	-	U	Yes
Benzo(g,h,i)perylene	41	ug/kg	1	-	U	Yes
Benzo(k)fluoranthene	41	ug/kg	1	-	U	Yes
4-Bromophenyl phenyl ether	83	ug/kg	1	-	U	Yes
Butyl benzyl phthalate	83	ug/kg	1	-	U	Yes
1,1'-Biphenyl	83	ug/kg	1	-	U	Yes
Benzaldehyde	210	ug/kg	1	-	U	Yes
2-Chloronaphthalene	83	ug/kg	1	-	U	Yes
4-Chloroaniline	210	ug/kg	1	-	U	Yes
Carbazole	83	ug/kg	1	-	U	Yes
Caprolactam	83	ug/kg	1	-	U	Yes
Chrysene	41	ug/kg	1	-	U	Yes
bis(2-Chloroethoxy)methane	83	ug/kg	1	-	U	Yes
bis(2-Chloroethyl)ether	83	ug/kg	1	-	U	Yes
bis(2-Chloroisopropyl)ether	83	ug/kg	1	-	U	Yes

4-Chlorophenyl phenyl ether	83	ug/kg	1	-	U	Yes
2,4-Dinitrotoluene	41	ug/kg	1	-	U	Yes
2,6-Dinitrotoluene	41	ug/kg	1	-	U	Yes
3,3'-Dichlorobenzidine	83	ug/kg	1	-	U	Yes
Dibenzo(a,h)anthracene	41	ug/kg	1	-	U	Yes
Dibenzofuran	83	ug/kg	1	-	U	Yes
Di-n-butyl phthalate	83	ug/kg	1	-	U	Yes
Di-n-octyl phthalate	83	ug/kg	1	-	U	Yes
Diethyl phthalate	83	ug/kg	1	-	U	Yes
Dimethyl phthalate	83	ug/kg	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	83	ug/kg	1	-	U	Yes
Fluoranthene	41	ug/kg	1	-	U	Yes
Fluorene	41	ug/kg	1	-	U	Yes
Hexachlorobenzene	83	ug/kg	1	-	U	Yes
Hexachlorobutadiene	41	ug/kg	1	-	U	Yes
Hexachlorocyclopentadiene	410	ug/kg	1	-	R	Yes
Hexachloroethane	210	ug/kg	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	41	ug/kg	1	-	U	Yes
Isophorone	83	ug/kg	1	-	U	Yes
1-Methylnaphthalene	83	ug/kg	1	-	U	Yes
2-Methylnaphthalene	83	ug/kg	1	-	U	Yes
2-Nitroaniline	210	ug/kg	1	-	U	Yes
3-Nitroaniline	210	ug/kg	1	-	U	Yes
4-Nitroaniline	210	ug/kg	1	-	U	Yes
Nitrobenzene	83	ug/kg	1	-	U	Yes
N-Nitroso-di-n-propylamine	83	ug/kg	1	-	U	Yes
Nitrosodiphenylamine	210	ug/kg	1	-	U	Yes
Phenanthrene	41	ug/kg	1	-	U	Yes
Pyrene	41	ug/kg	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	210	ug/kg	1	-	U	Yes

METHOD: 8270D (SIM)

Naphthalene	4.1	ug/kg	1	-	U	Yes
1,4-Dioxane	4.1	ug/kg	1	-	U	Yes

Sample ID: JC20768-3
Sample location: BMSMC Building 5 Area
Sampling date: 5/20/2016
Matrix: Soil

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	75	ug/kg	1	-	U	Yes
4-Chloro-3-methyl phenol	190	ug/kg	1	-	U	Yes
2,4-Dichlorophenol	190	ug/kg	1	-	U	Yes
2,4-Dimethylphenol	190	ug/kg	1	-	U	Yes
2,4-Dinitrophenol	190	ug/kg	1	-	U	Yes
4,6-Dinitro-o-cresol	190	ug/kg	1	-	UJ	Yes
2-Methylphenol	75	ug/kg	1	-	U	Yes
3&4-Methylphenol	75	ug/kg	1	-	U	Yes
2-Nitrophenol	190	ug/kg	1	-	U	Yes
4-Nitrophenol	380	ug/kg	1	-	U	Yes
Pentachlorophenol	190	ug/kg	1	-	U	Yes
Phenol	75	ug/kg	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	190	ug/kg	1	-	U	Yes
2,4,5-Trichlorophenol	190	ug/kg	1	-	U	Yes
2,4,6-Trichlorophenol	190	ug/kg	1	-	U	Yes
Acenaphthene	38	ug/kg	1	-	U	Yes
Acenaphthylene	38	ug/kg	1	-	U	Yes
Acetophenone	190	ug/kg	1	-	U	Yes
Anthracene	38	ug/kg	1	-	U	Yes
Atrazine	75	ug/kg	1	-	U	Yes
Benzo(a)anthracene	145	ug/kg	1	-	-	Yes
Benzo(a)pyrene	74.7	ug/kg	1	-	-	Yes
Benzo(b)fluoranthene	111	ug/kg	1	-	-	Yes
Benzo(g,h,i)perylene	26.0	ug/kg	1	J	UJ	Yes
Benzo(k)fluoranthene	41.6	ug/kg	1	-	-	Yes
4-Bromophenyl phenyl ether	75	ug/kg	1	-	U	Yes
Butyl benzyl phthalate	75	ug/kg	1	-	U	Yes
1,1'-Biphenyl	75	ug/kg	1	-	U	Yes
Benzaldehyde	190	ug/kg	1	-	U	Yes
2-Chloronaphthalene	75	ug/kg	1	-	U	Yes
4-Chloroaniline	190	ug/kg	1	-	U	Yes
Carbazole	75	ug/kg	1	-	U	Yes
Caprolactam	75	ug/kg	1	-	U	Yes
Chrysene	83.7	ug/kg	1	-	-	Yes
bis(2-Chloroethoxy)methane	75	ug/kg	1	-	U	Yes
bis(2-Chloroethyl)ether	75	ug/kg	1	-	U	Yes
bis(2-Chloroisopropyl)ether	75	ug/kg	1	-	U	Yes

4-Chlorophenyl phenyl ether	75	ug/kg	1	-	U	Yes
2,4-Dinitrotoluene	38	ug/kg	1	-	U	Yes
2,6-Dinitrotoluene	38	ug/kg	1	-	U	Yes
3,3'-Dichlorobenzidine	75	ug/kg	1	-	U	Yes
Dibenzo(a,h)anthracene	38	ug/kg	1	-	U	Yes
Dibenzofuran	75	ug/kg	1	-	U	Yes
Di-n-butyl phthalate	75	ug/kg	1	-	U	Yes
Di-n-octyl phthalate	75	ug/kg	1	-	U	Yes
Diethyl phthalate	75	ug/kg	1	-	U	Yes
Dimethyl phthalate	75	ug/kg	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	75	ug/kg	1	-	U	Yes
Fluoranthene	1010	ug/kg	1	-	-	Yes
Fluorene	38	ug/kg	1	-	U	Yes
Hexachlorobenzene	75	ug/kg	1	-	U	Yes
Hexachlorobutadiene	41	ug/kg	1	-	U	Yes
Hexachlorocyclopentadiene	380	ug/kg	1	-	U	Yes
Hexachloroethane	190	ug/kg	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	34.3	ug/kg	1	J	UJ	Yes
Isophorone	75	ug/kg	1	-	U	Yes
1-Methylnaphthalene	75	ug/kg	1	-	U	Yes
2-Methylnaphthalene	75	ug/kg	1	-	U	Yes
2-Nitroaniline	190	ug/kg	1	-	U	Yes
3-Nitroaniline	190	ug/kg	1	-	U	Yes
4-Nitroaniline	190	ug/kg	1	-	U	Yes
Nitrobenzene	75	ug/kg	1	-	U	Yes
N-Nitroso-di-n-propylamine	75	ug/kg	1	-	U	Yes
Nitrosodiphenylamine	190	ug/kg	1	-	U	Yes
Phenanthrene	38	ug/kg	1	-	U	Yes
Pyrene	672	ug/kg	1	-	-	Yes
1,2,4,5-Tetrachlorobenzene	190	ug/kg	1	-	U	Yes

METHOD: 8270D (SIM)

Naphthalene	3.8	ug/kg	1	-	U	Yes
1,4-Dioxane	3.8	ug/kg	1	-	R	Yes

Sample ID: JC20768-4
Sample location: BMSMC Building 5 Area
Sampling date: 5/20/2016
Matrix: Soil

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	80	ug/kg	1	-	U	Yes
4-Chloro-3-methyl phenol	200	ug/kg	1	-	U	Yes
2,4-Dichlorophenol	200	ug/kg	1	-	U	Yes
2,4-Dimethylphenol	200	ug/kg	1	-	U	Yes
2,4-Dinitrophenol	200	ug/kg	1	-	U	Yes
4,6-Dinitro-o-cresol	200	ug/kg	1	-	UJ	Yes
2-Methylphenol	80	ug/kg	1	-	U	Yes
3&4-Methylphenol	80	ug/kg	1	-	U	Yes
2-Nitrophenol	200	ug/kg	1	-	U	Yes
4-Nitrophenol	400	ug/kg	1	-	U	Yes
Pentachlorophenol	200	ug/kg	1	-	U	Yes
Phenol	80	ug/kg	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	200	ug/kg	1	-	U	Yes
2,4,5-Trichlorophenol	200	ug/kg	1	-	U	Yes
2,4,6-Trichlorophenol	200	ug/kg	1	-	U	Yes
Acenaphthene	40	ug/kg	1	-	U	Yes
Acenaphthylene	40	ug/kg	1	-	U	Yes
Acetophenone	200	ug/kg	1	-	U	Yes
Anthracene	40	ug/kg	1	-	U	Yes
Atrazine	80	ug/kg	1	-	U	Yes
Benzo(a)anthracene	40	ug/kg	1	-	U	Yes
Benzo(a)pyrene	40	ug/kg	1	-	U	Yes
Benzo(b)fluoranthene	40	ug/kg	1	-	U	Yes
Benzo(g,h,i)perylene	40	ug/kg	1	-	U	Yes
Benzo(k)fluoranthene	40	ug/kg	1	-	U	Yes
4-Bromophenyl phenyl ether	80	ug/kg	1	-	U	Yes
Butyl benzyl phthalate	80	ug/kg	1	-	U	Yes
1,1'-Biphenyl	80	ug/kg	1	-	U	Yes
Benzaldehyde	200	ug/kg	1	-	U	Yes
2-Chloronaphthalene	80	ug/kg	1	-	U	Yes
4-Chloroaniline	200	ug/kg	1	-	U	Yes
Carbazole	80	ug/kg	1	-	U	Yes
Caprolactam	80	ug/kg	1	-	U	Yes
Chrysene	40	ug/kg	1	-	U	Yes
bis(2-Chloroethoxy)methane	80	ug/kg	1	-	U	Yes
bis(2-Chloroethyl)ether	80	ug/kg	1	-	U	Yes
bis(2-Chloroisopropyl)ether	80	ug/kg	1	-	U	Yes

4-Chlorophenyl phenyl ether	80	ug/kg	1	-	U	Yes
2,4-Dinitrotoluene	40	ug/kg	1	-	U	Yes
2,6-Dinitrotoluene	40	ug/kg	1	-	U	Yes
3,3'-Dichlorobenzidine	80	ug/kg	1	-	U	Yes
Dibenzo(a,h)anthracene	40	ug/kg	1	-	U	Yes
Dibenzofuran	80	ug/kg	1	-	U	Yes
Di-n-butyl phthalate	80	ug/kg	1	-	U	Yes
Di-n-octyl phthalate	80	ug/kg	1	-	U	Yes
Diethyl phthalate	80	ug/kg	1	-	U	Yes
Dimethyl phthalate	80	ug/kg	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	142	ug/kg	1	-	-	Yes
Fluoranthene	40	ug/kg	1	-	U	Yes
Fluorene	40	ug/kg	1	-	U	Yes
Hexachlorobenzene	80	ug/kg	1	-	U	Yes
Hexachlorobutadiene	40	ug/kg	1	-	U	Yes
Hexachlorocyclopentadiene	400	ug/kg	1	-	U	Yes
Hexachloroethane	200	ug/kg	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	40	ug/kg	1	-	U	Yes
Isophorone	80	ug/kg	1	-	U	Yes
1-Methylnaphthalene	80	ug/kg	1	-	U	Yes
2-Methylnaphthalene	80	ug/kg	1	-	U	Yes
2-Nitroaniline	200	ug/kg	1	-	U	Yes
3-Nitroaniline	200	ug/kg	1	-	U	Yes
4-Nitroaniline	200	ug/kg	1	-	U	Yes
Nitrobenzene	80	ug/kg	1	-	U	Yes
N-Nitroso-di-n-propylamine	80	ug/kg	1	-	U	Yes
Nitrosodiphenylamine	200	ug/kg	1	-	U	Yes
Phenanthrene	40	ug/kg	1	-	U	Yes
Pyrene	40	ug/kg	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	200	ug/kg	1	-	U	Yes
METHOD: 8270D (SIM)						
Naphthalene	4.0	ug/kg	1	-	U	Yes
1,4-Dioxane	4.0	ug/kg	1	-	U	Yes

Sample ID: JC20768-5
Sample location: BMSMC Building 5 Area
Sampling date: 5/20/2016
Matrix: Soil

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	80	ug/kg	1	-	U	Yes
4-Chloro-3-methyl phenol	200	ug/kg	1	-	U	Yes
2,4-Dichlorophenol	200	ug/kg	1	-	U	Yes
2,4-Dimethylphenol	200	ug/kg	1	-	U	Yes
2,4-Dinitrophenol	200	ug/kg	1	-	U	Yes
4,6-Dinitro-o-cresol	200	ug/kg	1	-	UJ	Yes
2-Methylphenol	80	ug/kg	1	-	U	Yes
3&4-Methylphenol	80	ug/kg	1	-	U	Yes
2-Nitrophenol	200	ug/kg	1	-	U	Yes
4-Nitrophenol	400	ug/kg	1	-	U	Yes
Pentachlorophenol	200	ug/kg	1	-	U	Yes
Phenol	80	ug/kg	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	200	ug/kg	1	-	U	Yes
2,4,5-Trichlorophenol	200	ug/kg	1	-	U	Yes
2,4,6-Trichlorophenol	200	ug/kg	1	-	U	Yes
Acenaphthene	40	ug/kg	1	-	U	Yes
Acenaphthylene	40	ug/kg	1	-	U	Yes
Acetophenone	200	ug/kg	1	-	U	Yes
Anthracene	40	ug/kg	1	-	U	Yes
Atrazine	80	ug/kg	1	-	U	Yes
Benzaldehyde	40	ug/kg	1	-	U	Yes
Benzo(a)anthracene	40	ug/kg	1	-	U	Yes
Benzo(a)pyrene	40	ug/kg	1	-	U	Yes
Benzo(b)fluoranthene	40	ug/kg	1	-	U	Yes
Benzo(g,h,i)perylene	40	ug/kg	1	-	U	Yes
Benzo(k)fluoranthene	80	ug/kg	1	-	U	Yes
4-Bromophenyl phenyl ether	80	ug/kg	1	-	U	Yes
Butyl benzyl phthalate	80	ug/kg	1	-	U	Yes
1,1'-Biphenyl	200	ug/kg	1	-	U	Yes
2-Chloronaphthalene	80	ug/kg	1	-	U	Yes
4-Chloroaniline	200	ug/kg	1	-	U	Yes
Carbazole	80	ug/kg	1	-	U	Yes
Caprolactam	80	ug/kg	1	-	U	Yes
Chrysene	40	ug/kg	1	-	U	Yes
bis(2-Chloroethoxy)methane	80	ug/kg	1	-	U	Yes
bis(2-Chloroethyl)ether	80	ug/kg	1	-	U	Yes
bis(2-Chloroisopropyl)ether	80	ug/kg	1	-	U	Yes
4-Chlorophenyl phenyl ether	80	ug/kg	1	-	U	Yes

2,4-Dinitrotoluene	40	ug/kg	1	-	U	Yes
2,6-Dinitrotoluene	40	ug/kg	1	-	U	Yes
3,3'-Dichlorobenzidine	80	ug/kg	1	-	U	Yes
Dibenzo(a,h)anthracene	40	ug/kg	1	-	U	Yes
Dibenzofuran	80	ug/kg	1	-	U	Yes
Di-n-butyl phthalate	80	ug/kg	1	-	U	Yes
Di-n-octyl phthalate	80	ug/kg	1	-	U	Yes
Diethyl phthalate	80	ug/kg	1	-	U	Yes
Dimethyl phthalate	80	ug/kg	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	80	ug/kg	1	-	U	Yes
Fluoranthene	40	ug/kg	1	-	U	Yes
Fluorene	40	ug/kg	1	-	U	Yes
Hexachlorobenzene	80	ug/kg	1	-	U	Yes
Hexachlorobutadiene	40	ug/kg	1	-	U	Yes
Hexachlorocyclopentadiene	400	ug/kg	1	-	U	Yes
Hexachloroethane	200	ug/kg	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	40	ug/kg	1	-	U	Yes
Isophorone	80	ug/kg	1	-	U	Yes
1-Methylnaphthalene	80	ug/kg	1	-	U	Yes
2-Methylnaphthalene	80	ug/kg	1	-	U	Yes
2-Nitroaniline	200	ug/kg	1	-	U	Yes
3-Nitroaniline	200	ug/kg	1	-	U	Yes
4-Nitroaniline	200	ug/kg	1	-	U	Yes
Nitrobenzene	80	ug/kg	1	-	U	Yes
N-Nitroso-di-n-propylamine	80	ug/kg	1	-	U	Yes
Nitrosodiphenylamine	200	ug/kg	1	-	U	Yes
Phenanthrene	40	ug/kg	1	-	U	Yes
Pyrene	40	ug/kg	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	200	ug/kg	1	-	U	Yes
METHOD: 8270D (SIM)						
Naphthalene	4.0	ug/kg	1	-	U	Yes
1,4-Dioxane	4.0	ug/kg	1	-	U	Yes

DATA REVIEW WORKSHEETS

Project Number:_JC20768_____
Date:_____May_19-20,_2016_____
Shipping Date:__May_20,_2016_____
EPA Region:_____2_____

REVIEW OF SEMIVOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: EPA Hazardous Waste Support Section, SOP HW-35A, July 2015 –Revision 0. *Semivolatile Data Validation*. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for SVOCs included:

Lab. Project/SDG No.: ____JC20768_____ Sample matrix: _Soil/Groundwater__
No. of Samples: ___5_Full_scan/5_SIM_____

Trip blank No.: _____-_____
Field blank No.: _____-_____
Equipment blank No.:_____-_____
Field duplicate No.:_____-_____

___X___ Data Completeness
___X___ Holding Times
___X___ GC/MS Tuning
___X___ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_ABN_TCL_list_by_method_SW846-8270D;_Naphthalene_and_1,4-Dioxane_
_analyzed_by_method_SW846-8270D_(SIM)_____
_____

Definition of Qualifiers:

J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:___June_17,_2016_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE EXTRACTED/ANALYZED	pH	ACTION
All samples extracted and analyzed within method recommended holding time. Sample preservation was acceptable.				

Cooler temperature (Criteria: 4 ± 2 °C): _____5.8°C_____

Actions

Results will be qualified based on the criteria of the following Table:

Table 1. Holding Time Actions for Semivolatile Analyses

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤ 7 days (for extraction) ≤ 40 days (for analysis)	Use professional judgment	
	No	> 7 days (for extraction) > 40 days (for analysis)	J	Use professional judgment
	Yes	≤ 7 days (for extraction) ≤ 40 days (for analysis)	No qualification	
	Yes	> 7 days (for extraction) > 40 days (for analysis)	J	UJ
	Yes/No	Grossly Exceeded	J	UJ or R
Non-Aqueous	No	≤ 14 days (for extraction) ≤ 40 days (for analysis)	Use professional judgment	
	No	> 14 days (for extraction) > 40 days (for analysis)	J	Use professional judgment
	Yes	≤ 14 days (for extraction) ≤ 40 days (for analysis)	No qualification	
	Yes	> 14 days (for extraction) > 40 days (for analysis)	J	UJ
	Yes/No	Grossly Exceeded	J	UJ or R

All criteria were met _X__
Criteria were not met see below ____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

_X__ The DFTPP performance results were reviewed and found to be within the specified criteria.

_X__ DFTPP tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

Notes: These requirements do not apply when samples are analyzed by the Selected Ion Monitoring (SIM) technique.

All mass spectrometer conditions must be identical to those used during the sample analysis. Background subtraction actions resulting in spectral distortion are unacceptable

Notes: No data should be qualified based of DFTPP failure.

The requirement to analyze the instrument performance check solution is optional when analysis of PAHs/pentachlorophenol is to be performed by the SIM technique.

List the samples affected:

Actions:

1. If sample are analyzed without a preceding valid instrument performance check or are analyzed 12 hours after the Instrument Performance Check, qualify all data in those samples as unusable (R).
2. If ion abundance criteria are not met, use professional judgment to determine to what extent the data may be utilized.
3. State in the Data Review Narrative, decisions to use analytical data associated with DFTPP instrument performance checks not meeting the contract requirements.
4. Use professional judgment to determine if associated data should be qualified based on the spectrum of the mass calibration compounds.

All criteria were met ___X___
Criteria were not met
and/or see below _____

INITIAL CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:__05/31/16;_06/05/16_(SIM)___ ___05/17/2016_(SIM)_____
Instrument ID numbers:_____GCMS4M_____ ___GCMS3M_____
Matrix/Level:_____Aqueous/low_____ ___Aqueous/low_____

Date of initial calibration:_05/23-24/2016_(Scan)_____ ___05/16/16;_(Scan)_____
Instrument ID numbers:_____GCMS5P_____ ___GCMS2M_____
Matrix/Level:_____Aqueous/low_____ ___Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and initial calibration verification meets the method and guidance validation document performance criteria.				

Actions:

Qualify the initial calibration analytes listed in Table 2 using the following criteria:

Table 3. Initial Calibration Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
Initial Calibration not performed at specified frequency and sequence	Use professional judgment R	Use professional judgment R
Initial Calibration not performed at the specified concentrations	J	UJ
RRF < Minimum RRF in Table 2 for target analyte	Use professional judgment J or R	R
RRF > Minimum RRF in Table 2 for target analyte	No qualification	No qualification
%RSD > Maximum %RSD in Table 2 for target analyte	J	Use professional judgment
%RSD ≤ Maximum %RSD in Table 2 for target analyte	No qualification	No qualification

Initial Calibration

Table 2. RRF, %RSD, and %D Acceptance Criteria in Initial Calibration and CCV for Semivolatile Analysis

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Opening Maximum %D[1]
1,4-Dioxane	0.010	40.0	≤40.0	≤50.0
Benzaldehyde	0.100	40.0	≤40.0	≤50.0
Phenol	0.080	20.0	≤20.0	≤25.0
Bis(2-chloroethyl)ether	0.100	20.0	≤20.0	≤25.0
2-Chlorophenol	0.200	20.0	≤20.0	≤25.0
2-Methylphenol	0.010	20.0	≤20.0	≤25.0
3-Methylphenol	0.010	20.0	≤20.0	≤25.0
2,2'-Oxybis-(1-chloropropane)	0.010	20.0	≤25.0	≤50.0
Acetophenone	0.060	20.0	≤20.0	≤25.0
4-Methylphenol	0.010	20.0	≤20.0	≤25.0
N-Nitroso-di-n-propylamine	0.080	20.0	≤25.0	≤25.0
Hexachloroethane	0.100	20.0	≤20.0	≤25.0
Nitrobenzene	0.090	20.0	≤20.0	≤25.0
Isophorone	0.100	20.0	≤20.0	≤25.0
2-Nitrophenol	0.060	20.0	≤20.0	≤25.0
2,4-Dimethylphenol	0.050	20.0	≤25.0	≤50.0
Bis(2-chloroethoxy)methane	0.080	20.0	≤20.0	≤25.0
2,4-Dichlorophenol	0.060	20.0	≤20.0	≤25.0
Naphthalene	0.200	20.0	≤20.0	≤25.0
4-Chloroaniline	0.010	40.0	≤40.0	≤50.0
Hexachlorobutadiene	0.040	20.0	≤20.0	≤25.0
Caprolactam	0.010	40.0	≤30.0	≤50.0
4-Chloro-3-methylphenol	0.040	20.0	≤20.0	≤25.0
2-Methylnaphthalene	0.100	20.0	≤20.0	≤25.0
Hexachlorocyclopentadiene	0.010	40.0	≤40.0	≤50.0
2,4,6-Trichlorophenol	0.090	20.0	≤20.0	≤25.0
2,4,5-Trichlorophenol	0.100	20.0	≤20.0	≤25.0
1,1'-Biphenyl	0.200	20.0	≤20.0	≤25.0

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Opening Maximum %D[1]
2-Chloronaphthalene	0.300	20.0	-20.0	-25.0
2-Nitroaniline	0.060	20.0	-25.0	-25.0
Dimethylphthalate	0.300	20.0	-25.0	-25.0
2,6-Dinitrotoluene	0.080	20.0	-20.0	-25.0
Acenaphthylene	0.400	20.0	-20.0	-25.0
3-Nitroaniline	0.010	20.0	-25.0	-50.0
Acenaphthene	0.200	20.0	-20.0	-25.0
2,4-Dinitrophenol	0.010	40.0	-50.0	-50.0
4-Nitrophenol	0.010	40.0	-40.0	-50.0
Dibenzofuran	0.300	20.0	-20.0	-25.0
2,4-Dinitrotoluene	0.070	20.0	-20.0	-25.0
Diethylphthalate	0.300	20.0	-20.0	-25.0
1,2,4,5-Tetrachlorobenzene	0.100	20.0	-20.0	-25.0
4-Chlorophenyl-phenylether	0.100	20.0	-20.0	-25.0
Fluorene	0.200	20.0	-20.0	-25.0
4-Nitroaniline	0.010	40.0	-40.0	-50.0
4,6-Dinitro-2-methylphenol	0.010	40.0	-30.0	-50.0
4-Bromophenyl-phenyl ether	0.070	20.0	-20.0	-25.0
N-Nitrosodiphenylamine	0.100	20.0	-20.0	-25.0
Hexachlorobenzene	0.050	20.0	-20.0	-25.0
Atrazine	0.010	40.0	-25.0	-50.0
Pentachlorophenol	0.010	40.0	-40.0	-50.0
Phenanthrene	0.200	20.0	-20.0	-25.0
Anthracene	0.200	20.0	-20.0	-25.0
Carbazole	0.050	20.0	-20.0	-25.0
Di-n-butylphthalate	0.500	20.0	-20.0	-25.0
Fluoranthene	0.100	20.0	-20.0	-25.0
Pyrene	0.400	20.0	-25.0	-50.0
Butylbenzylphthalate	0.100	20.0	-25.0	-50.0

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Opening Maximum %D[1]
3,3'-Dichlorobenzidine	0.010	40.0	- 40.0	- 50.0
Benzo(a)anthracene	0.300	20.0	- 20.0	- 25.0
Chrysene	0.200	20.0	- 20.0	- 50.0
Bis(2-ethylhexyl) phthalate	0.200	20.0	- 25.0	- 50.0
Di-n-octylphthalate	0.010	40.0	- 40.0	- 50.0
Benzo(b)fluoranthene	0.010	20.0	- 25.0	- 50.0
Benzo(k)fluoranthene	0.010	20.0	- 25.0	- 50.0
Benzo(a)pyrene	0.010	20.0	- 20.0	- 50.0
Indeno(1,2,3-cd)pyrene	0.010	20.0	- 25.0	- 50.0
Dibenzo(a,h)anthracene	0.010	20.0	- 25.0	- 50.0
Benzo(g,h,i)perylene	0.010	20.0	- 30.0	- 50.0
2,3,4,6-Tetrachlorophenol	0.040	20.0	- 20.0	- 50.0
Naphthalene	0.600	20.0	- 25.0	- 25.0
2-Methylnaphthalene	0.300	20.0	- 20.0	- 25.0
Acenaphthylene	0.900	20.0	- 20.0	- 25.0
Acenaphthene	0.500	20.0	- 20.0	- 25.0
Fluorene	0.700	20.0	- 25.0	- 50.0
Phenanthrene	0.300	20.0	- 25.0	- 50.0
Anthracene	0.400	20.0	- 25.0	- 50.0
Fluoranthene	0.400	20.0	- 25.0	- 50.0
Pyrene	0.500	20.0	- 30.0	- 50.0
Benzo(a)anthracene	0.400	20.0	- 25.0	- 50.0
Chyrsene	0.400	20.0	- 25.0	- 50.0
Benzo(b)fluoranthene	0.100	20.0	- 30.0	- 50.0
Benzo(k)fluoranthene	0.100	20.0	- 30.0	- 50.0
Benzo(a)pyrene	0.100	20.0	- 25.0	- 50.0
Indeno(1,2,3-cd)pyrene	0.100	20.0	- 40.0	- 50.0
Dibenzo(a,h)anthracene	0.010	25.0	- 40.0	- 50.0
Benzo(g,h,i)perylene	0.020	25.0	- 40.0	- 50.0

Pentachlorophenol	0.010	40.0	-50.0	-50.0
Deuterated Monitoring Compounds				

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Closing Maximum %D
1,4-Dioxane-d_8	0.010	20.0	-25.0	-50.0
Phenol-d_5	0.010	20.0	-25.0	-25.0
Bis-(2-chloroethyl)ether-d_8	0.100	20.0	-20.0	-25.0
2-Chlorophenol-d_4	0.200	20.0	-20.0	-25.0
4-Methylphenol-d_8	0.010	20.0	-20.0	-25.0
4-Chloroaniline-d_4	0.010	40.0	-40.0	-50.0
Nitrobenzene-d_5	0.050	20.0	-20.0	-25.0
2-Nitrophenol-d_4	0.050	20.0	-20.0	-25.0
2,4-Dichlorophenol-d_3	0.060	20.0	-20.0	-25.0
Dimethylphthalate-d_6	0.300	20.0	-20.0	-25.0
Acenaphthylene-d_8	0.400	20.0	-20.0	-25.0
4-Nitrophenol-d_4	0.010	40.0	-40.0	-50.0
Fluorene-d_{10}	0.100	20.0	-20.0	-25.0
4,6-Dinitro-2-methylphenol-d_3	0.010	40.0	-30.0	-50.0
Anthracene-d_{10}	0.300	20.0	-20.0	-25.0
Pyrene-d_{10}	0.300	20.0	-25.0	-50.0
Benzo(a)pyrene-d_{12}	0.010	20.0	-20.0	-50.0
Fluoranthene-d_{10} (SIM)	0.400	20.0	-25.0	-50.0
2-Methylnaphthalene-d_{10} (SIM)	0.300	20.0	-20.0	-25.0

[1] If a closing CCV is acting as an opening CCV, all target analytes must meet the requirements for an opening CCV.

Note: If analysis by SIM technique is requested for PAH/pentachlorophenols, calibration standards analyzed at 0.10, 0.20, 0.40, 0.80, and 1.0 ng/uL for each target compound of interest and the associated DMCs. Pentachlorophenol will require only a four point initial calibration at 0.20, 0.40, 0.80, and 1.0 ng/uL.

All criteria were met _____
Criteria were not met
and/or see below __X___

CONTINUING CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____05/17/16_(SIM)_____
Date of initial calibration verification (ICV):_____05/17-18/16_____
Date of continuing calibration verification (CCV):_05/24/16;_05/27/16_____
Date of closing CCV:_____-_____
Instrument ID numbers:_____GCMS3M_____
Matrix/Level:_____Aqueous/low_____

Date of initial calibration:____05/23-24/16_(Scan)_____
Date of initial calibration verification (ICV):____05/24/16_____
Date of continuing calibration verification (CCV):__05/31/16_____
Date of closing CCV:_____-_____
Instrument ID numbers:_____GCMS5P_____
Matrix/Level:_____Aqueous/low_____

Date of initial calibration:_____05/16/16_(Scan)_____
Date of initial calibration verification (ICV):____05/16-17/16_____
Date of continuing calibration verification (CCV):__05/23/16_____
Date of closing CCV:_____-_____
Instrument ID numbers:_____GCMS2M_____
Matrix/Level:_____Aqueous/low_____

Date of initial calibration:_____05/31/16;_06/05/16_(SIM)_____
Date of initial calibration verification (ICV):____05/31/16;_06/05/16_____
Date of continuing calibration verification (CCV):__06/03/16;_06/06/16_____
Date of closing CCV:_____-_____
Instrument ID numbers:_____GCMS4M_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
GCMS5P				
05/31/16	cc1440-50	-37.8	2,4-dinitrophenol*	JC20768-2; -3; -4; -5
		-41.7	4,6-Dinitro-2-methylphenol	
		-20.6	Pentachlorophenol*	

Note: Initial and continuing calibration verifications meet the method and guidance document required performance criteria except the cases describe in this document. Analyte results are qualified as (J) or (UJ) in affected samples.

No closing calibration verification included in data package. No action taken, professional judgment.

* Analytes with % difference in the continue calibration verification outside the method performance criteria but within the validation guidelines criteria, + 40 %. No action taken.

Actions:

Notes: Verify that the CCV is run at the required frequency (an opening and closing CCV must be run within 12-hour period).

All DMCs must meet the RRF values given in Table 2. No qualification of the data is necessary on DMCs RRF and %RSD/%D alone. Use professional judgment to evaluate DMCs and %RSD/%D data in conjunction with DMCs recoveries to determine the need for qualification of the data.

Qualify the initial calibration analytes listed in Table 2 using the following criteria in the CCVs:

Table 4. CCV Actions for Semivolatile Analysis

Criteria for Opening CCV	Criteria for Closing CCV	Action	
		Detect	Non-detect
CCV not performed at required frequency and sequence	CCV not performed at required frequency	Use professional judgment R	Use professional judgment R
CCV not performed at specified concentration	CCV not performed at specified concentration	Use professional judgment	Use professional judgment
RRF < Minimum RRF in Table 2 for target analyte	RRF < Minimum RRF in Table 2 for target analyte	Use professional judgment J or R	R
RRF > Minimum RRF in Table 2 for target analyte	RRF > Minimum RRF in Table 2 for target analyte	No qualification	No qualification
%D outside the Opening Maximum %D limits in Table 2 for target analyte	%D outside the Closing Maximum %D limits in Table 2 for target analyte	J	UJ
%D within the inclusive Opening Maximum %D limits in Table 2 for target analyte	%D within the inclusive Closing Maximum %D limits in Table 2 for target analyte	No qualification	No qualification

All criteria were met __X___
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Notes: The concentration of non-target compounds in all blanks must be less than or equal to 10 ug/L.

The concentration of target compounds in all blanks must be less than its CRQL listed in the method.

Samples taken from a drinking water tap do not have and associated field blank.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_____	_____	_____	_____	_____
_No_target_analytes_detected_in_method_blanks._____				
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_field/trip/equipment_blanks_analyzed_with_this_data_package._____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				

All criteria were met __X__
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Qualify samples based on the criteria summarized in Table 5:

Table 5. Blank and TCLP/SPLP LEB Actions for Semivolatile Analysis

Blank Type	Blank Result	Sample Result	Action
Method, TCLP/SPLP LEB, Field	Detect	Non-detect	No qualification
	< CRQL	< CRQL	Report at CRQL and qualify as non-detect (U)
		> CRQL	Use professional judgment
	> CRQL	< CRQL	Report at CRQL and qualify as non-detect (U)
		> CRQL but < Blank Result	Report at sample results and qualify as non-detect (U) or as unusable (R)
		> CRQL and > Blank Result	Use professional judgment
	Grossly high	Detect	Report at sample results and qualify as unusable (R)
	TIC > 5.0 ug/L (water) or 0.0050 mg/L (TCLP leachate) or TIC > 170 ug/Kg (soil)	Detect	Use professional judgment

List samples qualified

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met __X__
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES – DEUTERATED MONITORING COMPOUNDS (DMCs)

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries – deuterated monitoring compounds. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

Notes: Recoveries for DMCs in samples and blanks must be within the limits specified in Table 6.

The recovery limits for any of the compounds listed in Table 6 may be expanded at any time during the period of performance if USEPA determines that the limits are too restrictive.

If a DMC is not added in the samples and blanks or the concentrations of DMCs in the samples and blank not the specified, use professional judgment in qualifying the data.

Table 7. DMC Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
%R < 10% (excluding DMC's with 10% as a lower acceptance limit)	J-	R
10% < %R (excluding DMC's with 10% as a lower acceptance limit) < Lower Acceptance Limit	J-	UJ
Lower Acceptance limit < %R < Upper Acceptance Limit	No qualification	No qualification
%R > Upper Acceptance Limit	J+	No qualification

List the percent recoveries (%Rs) which do not meet the criteria for DMCs (surrogate) recovery.

Matrix:___Groundwater/Soil_____

SAMPLE ID	SURROGATE COMPOUND	ACTION

_____

_DMCs_meet_the_required_criteria._Non-deuterated_surrogates_added_to_the_samples_were__
_within_laboratory_recovery_limits._____

Table 8. Semivolatile DMCs and the Associated Target Analytes

1,4-Dioxane-d_8 (DMC-1)	**Phenol-d_5 (DMC-2)**	**Bis(2-Chloroethyl) ether-d_8 (DMC-3)**
1,4-Dioxane	Benzaldehyde Phenol	Bis(2-chloroethyl)ether 2,2'-Oxybis(1-chloropropane) Bis(2-chloroethoxy)methane
2-Chlorophenol-d_4 (DMC-4)	**4-Methylphenol-d_8 (DMC-5)**	**4-Chloroaniline-d_4 (DMC-6)**
2-Chlorophenol	2-Methylphenol 3-Methylphenol 4-Methylphenol 2,4-Dimethylphenol	4-Chloroaniline Hexachlorocyclopentadiene Dichlorobenzidine
Nitrobenzene-d_5 (DMC-7)	**2-Nitrophenol-d_4 (DMC-8)**	**2,4-Dichlorophenol-d_3 (DMC-9)**
Acetophenone N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene 2,6-Dinitrotoluene 2,4-Dinitrotoluene N-Nitrosodiphenylamine	Isophorone 2-Nitrophenol	2,4-Dichlorophenol Hexachlorobutadiene Hexachlorocyclopentadiene 4-Chloro-3-methylphenol 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 1,2,4,5-Tetrachlorobenzene *Pentachlorophenol 2,3,4,6-Tetrachlorophenol
Dimethylphthalate-d_6 (DMC-10)	**Acenaphthylene-d_8 (DMC-11)**	**4-Nitrophenol-d_4 (DMC-12)**
Caprolactam 1,1'-Biphenyl Dimethylphthalate Diethylphthalate Di-n-butylphthalate Butylbenzylphthalate Bis(2-ethylhexyl) phthalate Di-n-octylphthalate	*Naphthalene *2-Methylnaphthalene 2-Chloronaphthalene *Acenaphthylene *Acenaphthene	2-Nitroaniline 3-Nitroaniline 2,4-Dinitrophenol 4-Nitrophenol 4-Nitroaniline

Fluorene-d_{10} (DMC-13)	**4,6-Dinitro-2-methylphenol-d_2 (DMC-14)**	**Anthracene-d_{10} (DMC-15)**
Dibenzofuran *Fluorene 4-Chlorophenyl-phenylether 4-Bromophenyl-phenylether Carbazole	4,6-Dinitro-2-methylphenol	Hexachlorobenzene Atrazine *Phenanthrene *Anthracene
Pyrene-d_{10} (DMC-16)	**Benzo(a)pyrene-d_{12} (DMC-17)**	
*Fluoranthene *Pyrene *Benzo(a)anthracene *Chrysene	3,3'-Dichlorobenzidine *Benzo(b)fluoranthene *Benzo(k)fluoranthene *Benzo(a)pyrene *Indeno(1,2,3-cd)pyrene *Dibenzo(a,h)anthracene *Benzo(g,h,i)perylene	

*Included in optional Target Analyte List (TAL) of PAHs and PCP only.

Table 9. Semivolatile SIM DMCs and the Associated Target Analytes

Fluoranthene-d10 (DMC-1)	**2-Methylnaphthalene-d10 (DMC-2)**
Fluoranthene	Naphthalene
Pyrene	2-Methylnaphthalene
Benzo(a)anthracene	Acenaphthylene
Chrysene	Acenaphthene
Benzo(b)fluoranthene	Fluorene
Benzo(k)fluoranthene	Pentachlorophenol
Benzo(a)pyrene	Phenanthrene
Indeno(1,2,3-cd)pyrene	Anthracene
Dibenzo(a,h)anthracene	
Benzo(g,h,i)perylene	

All criteria were met _____
Criteria were not met
and/or see below ___X___

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

NOTES: Data for MS and MSDs will not be present unless requested by the Region. Notify the Contract Laboratory COR if a field or trip blank was used for the MS and MSD.

For a Matrix Spike that does not meet criteria, apply the action to only the field sample used to prepare the Matrix Spike sample. If it is clearly stated in the data validation materials that the samples were taken through incremental sampling or some other method guaranteeing the homogeneity of the sample group, then the entire sample group may be qualified.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JC20414-2_____ Matrix/Level:__Aqueous_____
Sample ID:__JC20768-2_____ Matrix/Level:__Soil_____
Sample ID:__JC20402-1_(SIM)_____ Matrix/Level:__Aqueous_____
Sample ID:__JC20768-3_(SIM)_____ Matrix/Level:__Soil_____

The QC reported here applies to the following samples: Method: SW846 8270D
JC20768-2, JC20768-4; JC20768-4, JC20768-5

Compound	JC20768-2 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
Hexachloro-cyclopentadiene	ND		4150	166	4* a	4130	145	4* a	14	10-127/46

(a) Outside control limits due to matrix interference.
* Outside control limit.

Note: Result for hexachlorocyclopentadiene rejected in sample JC20768-2.

The QC reported here applies to the following samples: Method: SW846 8270D BY SIM
JC20768-4, JC20768-5

Compound	JC20768-3 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
1,4-Dioxane	ND		188	8.44	4* a	188	9.18	5* a	8	50-150/30

(a) Outside control limits due to matrix interference.
* Outside control limit.

Note: 1,4-dioxane not detected in sample JC20768-3. Non-detects are rejected (R).

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below ____

INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Internal area meets the required criteria of batch samples corresponding to this data package.

Action:

1. If an internal standard area count for a sample or blank is greater than 200.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration) (see Table 10 below):
   a. Qualify detects for compounds quantitated using that internal standard as estimated low (J-).
   b. Do not qualify non-detected associated compounds.
2. If an internal standard area count for a sample or blank is less than 20.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration):
   a. Qualify detects for compounds quantitated using that internal standard as estimated high (J+).
   b. Qualify non-detected associated compounds as unusable (R).
3. If an internal standard area count for a sample or blank is greater than or equal to 50.0%, and less than or equal to 200% of the area for the associated standard opening CCV or mid-point standard from initial calibration, no qualification of the data is necessary.
4. If an internal standard RT varies by more than 10.0 seconds: Examine the chromatographic profile for that sample to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Detects should not need to be qualified as unusable (R) if the mass spectral criteria are met.
5. If an internal standard RT varies by less than or equal to 10.0 seconds, no qualification of the data is necessary.

Note: Inform the Contract Laboratory Program Project Officer (CLP PO) if the internal standard performance criteria are grossly exceeded. Note in the Data Review Narrative potential effects on the data resulting from unacceptable internal standard performance.

State in the Data Review Narrative if the required internal standard compounds are not added to a sample or blank or if the required internal standard compound is not analyzed at the specified concentration.

Actions:

Table 10. Internal Standard Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
Area response < 20% of the opening CCV or mid-point standard CS3 from ICAL	J	R
20% < Area response < 50% of the opening CCV or mid-point standard CS3 from ICAL	J	UJ
50% < Area response < 200% of the opening CCV or mid-point standard CS3 from ICAL	No qualification	No qualification
Area response > 200% of the opening CCV or mid-point standard CS3 from ICAL	J-	No qualification
RT shift between sample/blank and opening CCV or mid-point standard CS3 from ICAL > 10.0 seconds	R	R
RT shift between sample/blank and opening CCV or mid-point standard CS3 from ICAL < 10.0 seconds	No qualification	No qualification

All criteria were met __X__
Criteria were not met
and/or see below _____

TARGET COMPOUND IDENTIFICATION

Criteria:

Is the Relative Retention Times (RRTs) of reported compounds within ±0.06 RRT units of the standard RRT [opening Continuing Calibration Verification (CCV) or mid-point standard from the initial calibration]. **Yes?** or No?

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions
_____	_____	_____
_____	_____	_____
_____	_____	_____

Mass spectra of the sample compound and a current laboratory-generated standard [i.e., the mass spectrum from the associated calibration standard (opening CCV or mid-point standard from initial calibration)] must match according to the following criteria:

a. All ions present in the standard mass spectrum at a relative intensity greater than 10% must be present in the sample spectrum.
b. The relative intensities of these ions must agree within ±20% between the standard and sample spectra (e.g., for an ion with an abundance of 50% in the standard spectrum, the corresponding sample ion abundance must be between 30-70%).
c. Ions present at greater than 10% in the sample mass spectrum, but not present in the standard spectrum, must be evaluated by a reviewer experienced in mass spectral interpretation.

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions
_____	_____	_____
_Identified_compounds_meet_the_required_criteria____		_____
_____	_____	_____

Action:

1. The application of qualitative criteria for GC/MS analysis of target compounds requires professional judgment. It is up to the reviewer's discretion to obtain additional information from the laboratory. If it is determined that incorrect identifications were made, qualify all such data as unusable (R).

2. Use professional judgment to qualify the data if it is determined that cross-contamination has occurred.

3. Note in the Data Review Narrative any changes made to the reported compounds or concerns regarding target compound identifications. Note, for Contract Laboratory COR action, the necessity for numerous or significant changes.

TENTATIVELY IDENTIFIED COMPOUNDS (TICS)

NOTE: Tentatively identified compounds should only be evaluated when requested by a party from outside of the Hazardous Waste Support Section (HWSS).

List TICs

Sample ID	Compound	Sample ID	Compound

Action:

1. Qualify all TIC results for which there is presumptive evidence of a match (e.g. greater than or equal to 85% match) as tentatively identified (NJ), with approximated concentrations. TICs labeled "unknown" are qualified as estimated (J).
2. General actions related to the review of TIC results are as follows:
   a. If it is determined that a tentative identification of a non-target compound is unacceptable, change the tentative identification to "unknown" or another appropriate identification, and qualify the result as estimated (J).
   b. If all contractually-required peaks were not library searched and quantitated, the Region's designated representative may request these data from the laboratory.
3. In deciding whether a library search result for a TIC represents a reasonable identification, use professional judgment. If there is more than one possible match, report the result as "either compound X or compound Y". If there is a lack of isomer specificity, change the TIC result to a nonspecific isomer result (e.g., 1,3,5-trimethyl benzene to trimethyl benzene isomer) or to a compound class (e.g., 2-methyl, 3-ethyl benzene to a substituted aromatic compound).
4. The reviewer may elect to report all similar compounds as a total (e.g., all alkanes may be summarized and reported as total hydrocarbons).

5. Target compounds from other fractions and suspected laboratory contaminants should be marked as "non-reportable".
6. Other Case factors may influence TIC judgments. If a sample TIC match is poor, but other samples have a TIC with a valid library match, similar RRT, and the same ions, infer identification information from the other sample TIC results.
7. Note in the Data Review Narrative any changes made to the reported data or any concerns regarding TIC identifications.
8. Note, for Contract Laboratory COR action, failure to properly evaluate and report TICs

All criteria were met __X__
Criteria were not met
and/or see below _____

SAMPLE QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)

Action:

1. When a sample is analyzed at more than one dilution, the lower CRQL are used unless a QC exceedance dictates the use of higher CRQLs from the diluted sample. Samples reported with an "E" qualifier should be reported from the diluted sample.
2. If any discrepancies are found, the Region's designated representative may contact the laboratory to obtain additional information that could resolve any differences. If a discrepancy remains unresolved, the reviewer must use professional judgment to decide which value is the most accurate. Under these circumstances, the reviewer may determine that qualification of data is warranted. Note in the Data Review Narrative a description of the reasons for data qualification and the qualification that is applied to the data.
3. For non-aqueous samples, if the solids is less than 10.0%, use professional judgment for both detects and non-detects. If the percent solid for a soil sample is greater than or equal to 10.0% and less than 30.0%, use professional judgment to qualify detects and non-detects. If the percent solid for a soil sample is greater than or equal to 30.0%, detects and non-detects should not be qualified (see Table 11).
4. Note, for Contract Laboratory COR action, numerous or significant failures to accurately quantify the target compounds or to properly evaluate and adjust CRQLs.
5. Results between MDL and CRQL should be qualified as estimated "J".
6. Results < MDL should be reported at the CRQL and qualified "U". MDLs themselves should not be reported.

Table 11. Percent Solids Actions for Semivolatile Analysis for Non-Aqueous Samples

Criteria	Action	
	Detects	Non-detects
%Solids < 10.0%	Use professional judgment	Use professional judgment
10.0% < %Solids < 30.0%	Use professional judgment	Use professional judgment
%Solids > 30.0%	No qualification	No qualification

SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

Sample ID:__ JC20768-1_(Scan)__ Analyte:__1,4-Dioxane_____ RF:_0.633_

[ ] = (94268)(40)/(604786)(0.633)
= 9.85 ppm Ok

QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

All criteria were met __N/A___
Criteria were not met
and/or see below _____

FIELD DUPLICATE PRECISION

Sample IDs: ___JC20768-1/JC20768-2_____ Matrix:____Groundwater_____

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: if large RPD (> 50 %) is observed, confirm identification of the samples and note differences. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL ug/L	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
Field duplicate analyzed as part of this data package. RPD within the required criteria < 50 % for detected target analytes.					

All criteria were met __X__
Criteria were not met
and/or see below _____

OTHER ISSUES

A. System Performance

List samples qualified based on the degradation of system performance during simple analysis:

Sample ID	Comments	Actions

Action:

Use professional judgment to qualify the data if it is determined that system performance has degraded during sample analyses. Inform the Contract Laboratory Program COR any action as a result of degradation of system performance which significantly affected the data.

B. Overall Assessment of Data

List samples qualified based on other issues:

Sample ID	Comments	Actions
_No_other_issues_that_required_the_need_to_qualify_the_data._Results_are_valid_and_can_be_used_for_decission_purposes._____		

Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.
2. Write a brief narrative to give the user an indication of the analytical limitations of the data. Inform the Contract Laboratory COR the action, any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).
3. Sometimes, due to dilutions, re-analysis or SIM/Scan runs are being performed, there will be multiple results for a single analyte from a single sample. The following criteria and professional judgment are used to determine which result should be reported:
    - The analysis with the lower CRQL
    - The analysis with the better QC results
    - The analysis with the higher results

EXECUTIVE NARRATIVE

SDG No:	**JC20768**	Laboratory:	**Accutest, Florida**
Analysis:	**SW846-8015C**	Number of Samples:	**5**
Location:	BMSMC, Building 5 Area Humacao, PR		

SUMMARY: Five (5) samples were analyzed for the low molecular weight alcohols (LMWAs) list following method SW846-8015C. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8015C are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues:	**None**
Major:	**None**
Minor:	**None**

Critical findings:	**None**
Major findings:	**None**
Minor findings:	**None**

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: 

Date: June 17, 2016

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC20768-1
Sample location: BMSMC Building 5 Area
Sampling date: 5/19/2016
Matrix: Groundwater

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	100	ug/l	1.0	-	U	Yes
Isobutyl Alcohol	100	ug/l	1.0	-	U	Yes
Isopropyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Propyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
sec-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
Methanol	200	ug/l	1.0	-	U	Yes

Sample ID: JC20768-2
Sample location: BMSMC Building 5 Area
Sampling date: 5/20/2016
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	130	ug/kg	1.0	-	U	Yes
Isobutyl Alcohol	130	ug/kg	1.0	-	U	Yes
Isopropyl Alcohol	130	ug/kg	1.0	-	U	Yes
n-Propyl Alcohol	130	ug/kg	1.0	-	U	Yes
n-Butyl Alcohol	130	ug/kg	1.0	-	U	Yes
sec-Butyl Alcohol	130	ug/kg	1.0	-	U	Yes
Methanol	250	ug/kg	1.0	-	U	Yes

Sample ID: JC20768-3
Sample location: BMSMC Building 5 Area
Sampling date: 5/20/2016
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	110	ug/kg	1.0	-	U	Yes
Isobutyl Alcohol	110	ug/kg	1.0	-	U	Yes
Isopropyl Alcohol	110	ug/kg	1.0	-	U	Yes
n-Propyl Alcohol	110	ug/kg	1.0	-	U	Yes
n-Butyl Alcohol	110	ug/kg	1.0	-	U	Yes
sec-Butyl Alcohol	110	ug/kg	1.0	-	U	Yes
Methanol	220	ug/kg	1.0	-	U	Yes

Sample ID: JC20768-4
Sample location: BMSMC Building 5 Area
Sampling date: 5/20/2016
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	120	ug/kg	1.0	-	U	Yes
Isobutyl Alcohol	120	ug/kg	1.0	-	U	Yes
Isopropyl Alcohol	120	ug/kg	1.0	-	U	Yes
n-Propyl Alcohol	120	ug/kg	1.0	-	U	Yes
n-Butyl Alcohol	120	ug/kg	1.0	-	U	Yes
sec-Butyl Alcohol	120	ug/kg	1.0	-	U	Yes
Methanol	250	ug/kg	1.0	-	U	Yes

Sample ID: JC20768-5
Sample location: BMSMC Building 5 Area
Sampling date: 5/20/2016
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	130	ug/kg	1.0	-	U	Yes
Isobutyl Alcohol	130	ug/kg	1.0	-	U	Yes
Isopropyl Alcohol	130	ug/kg	1.0	-	U	Yes
n-Propyl Alcohol	130	ug/kg	1.0	-	U	Yes
n-Butyl Alcohol	130	ug/kg	1.0	-	U	Yes
sec-Butyl Alcohol	130	ug/kg	1.0	-	U	Yes
Methanol	250	ug/kg	1.0	-	U	Yes

DATA REVIEW WORKSHEETS

Project Number:___JC20768_____
Date:_____05/19-20/2016_____
Shipping Date:____05/20/2016_____
EPA Region:_____2_____

REVIEW OF VOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8015C are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.
The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The modified data review for VOCs included:

Lab. Project/SDG No.: __JC20768_____ Sample matrix: ___SoilGroundwater_____
No. of Samples: _____5_____

Trip blank No.: _____-_____
Field blank No.: _____-_____
Equipment blank No.:___-_____
Field duplicate No.:_____-_____

___X___ Data Completeness
___X___ Holding Times
___N/A_ GC/MS Tuning
___N/A_ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_Low_molecular_weight_alcohols_by_SW-846_8015C_____
_____

Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:__June_17,_2016_____

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below ____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
All samples analyzed within the recommended method holding time. All samples properly preserved.				

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4°C), no air bubbles.
Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Soil samples- 7 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): 5.8°C

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).
If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)
If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).
If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).
If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).
If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).
If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were met __N/A__
Criteria were not met see below ____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__N/A_ The BFB performance results were reviewed and found to be within the specified criteria.

__N/A_ BFB tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected: _____

If mass calibration is in error, all associated data are rejected.

All criteria were met __X__
Criteria were not met
and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____05/17/16_____
Dates of continuing calibration:_05/17/16 (initial);_05/23/16;_05/24/16_
Dates of final calibration verification:__05/23/16;_05/24/16_____
Instrument ID number:_____GCGH_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED

Note: Initial, continuing, and final calibration verifications meets method specific criteria in at least one of the column, second column used for confirmation only.

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be ≤ 15 % regardless of method requirements for CCC.
All %Ds must be ≤ 20% regardless of method requirements for CCC.
It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of ≥ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r < 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met __X__
Criteria were not met
and/or see below _____

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
All_method_blank_meeth_method_specific_criteria				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
No_field/trip/equipment_blanks_included_in_this_data_package.				

All criteria were met __X__
Criteria were not met
and/or see below ____

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)
ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and ≤ AL, report the compound as not detected (U) at the SQL.
If the concentration is ≥ SQL but ≤ AL, report the compound as not detected (U) at the reported concentration.
If the concentration is ≥ SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately
Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met ___X___
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.
List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.
Matrix: solid/aqueous

SAMPLE ID	SURROGATE COMPOUND				ACTION
	Hexanol	~~DBFM~~	~~TOL-d8~~	~~BFB~~	

_All_surrogate_recoveries_within_laboratory_control_limits._____

QC Limits* (Aqueous)
_____LL_to_UL___ _73_to_123_ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Low)
_____LL_to_UL___ _69_to_121__ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Med)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____

1,2-DCA = 1,2-Dichloromethane-d4 TOL-d8 = Toluene-d8
DBFM = Dibromofluoromethane BFB = Bromofluorobenzene

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.
If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met __X___
Criteria were not met
and/or see below _____

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JC20768-1MS/-MSD_____ Matrix/Level:____Groundwater/ow_____
Sample ID:__JC20768-2MS/-MSD_____ Matrix/Level:____Soil/ow_____

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION
MS/MSD%_recoveries_and_RPD_within_laboratory_control_limits					

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All criteria were met __X__
Criteria were not met
and/or see below ____

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:_____-_____ Matrix/Level/Unit:_____-_____

COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

* If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).
* If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? **Yes** or No. If no make note in data review memo.

List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT

___Recoveries_within_laboratory_control_limits._____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met ___N/A___
Criteria were not met
and/or see below _____

IX. FIELD/LABORATORY DUPLICATE PRECISION

Sample IDs: _____-_____ Matrix:_____-_____

Field/laboratory duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: RPD ± 30% for aqueous samples, RPD ± 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
No field/laboratory duplicate analyzed with this data package. MS/MSD % recoveries RPD used to assess precision. RPD within laboratory and generally acceptable control limits.					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met __N/A___
Criteria were not met
and/or see below _____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

* Area of +100% or -50% of the IS area in the associated calibration standard.
* Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JC20768-1MS

isopropyl alcohol RF = 19.93

[ ] = (105977)/(19.93)

= 5,317 ppm OK

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

B. Percent Solids

List samples which have ≤ 50 % solids

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R)

EXECUTIVE NARRATIVE

SDG No:	**JC20768**	Laboratory:	**Accutest, New Jersey**
Analysis:	**SW846-8081B**	Number of Samples:	**2**

Location: BMSMC, Building 5 Area
Humacao, PR

SUMMARY: Two (2) samples were analyzed for selected pesticides following method SW846-8081B. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence *Hazardous Waste Support Section SOP No. HW-36A, Revision 0, June, 2015. SOM02.2. Pesticide Data Validation.* The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: **None**
Major: **None**
Minor: **None**

Critical findings: **None**
Major findings: **None**
Minor findings:

1. Initial and initial calibration verification within the guidance document performance criteria. Continuing calibration % differences meet the performance criteria in at least one of the two columns. Final calibration verification included in data. % differences meet the performance criteria package except for 4,4'-DDT and Methoxychlor. No action taken, professional judgment.

2. MS/MSD % recoveries outside control limits for several analytes in sample JC20583-2MS/MSD. No action taken, high level in sample compared to amount spiked.

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: 

Date: June 17, 2016

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC20768-4 "1
Sample location: BMSMC Building 5 Area
Sampling date: 20-May-16
Matrix: Soil

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	0.74	ug/kg	1	-	U	Yes
alpha-BHC	0.74	ug/kg	1	-	U	Yes
beta-BHC	0.74	ug/kg	1	-	U	Yes
delta-BHC	0.74	ug/kg	1	-	U	Yes
gamma-BHC (Lindane)	0.74	ug/kg	1	-	U	Yes
alpha-Chlordane	0.74	ug/kg	1	-	U	Yes
gamma-Chlordane	0.74	ug/kg	1	-	U	Yes
Dieldrin	0.74	ug/kg	1	-	U	Yes
4,4'-DDD	0.74	ug/kg	1	-	U	Yes
4,4'-DDE	0.74	ug/kg	1	-	U	Yes
4,4'-DDT	0.74	ug/kg	1	-	U	Yes
Endrin	0.74	ug/kg	1	-	U	Yes
Endosulfan sulfate	0.74	ug/kg	1	-	U	Yes
Endrin aldehyde	0.74	ug/kg	1	-	U	Yes
Endosulfan-I	0.74	ug/kg	1	-	U	Yes
Endosulfan-II	0.74	ug/kg	1	-	U	Yes
Heptachlor	0.74	ug/kg	1	-	U	Yes
Heptachlor epoxide	0.74	ug/kg	1	-	U	Yes
Methoxychlor	1.5	ug/kg	1	-	UJ	Yes
Endrin ketone	0.74	ug/kg	1	-	U	Yes
Toxaphene	18	ug/kg	1	-	U	Yes

Sample ID: JC20768-#5
Sample location: BMSMC Building 5 Area
Sampling date: 20-May-16
Matrix: Soil

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	0.79	ug/kg	1	-	U	Yes
alpha-BHC	0.79	ug/kg	1	-	U	Yes
beta-BHC	0.79	ug/kg	1	-	U	Yes
delta-BHC	0.79	ug/kg	1	-	U	Yes
gamma-BHC (Lindane)	0.79	ug/kg	1	-	U	Yes
alpha-Chlordane	0.79	ug/kg	1	-	U	Yes
gamma-Chlordane	0.79	ug/kg	1	-	U	Yes
Dieldrin	0.79	ug/kg	1	-	U	Yes
4,4'-DDD	0.79	ug/kg	1	-	U	Yes
4,4'-DDE	0.79	ug/kg	1	-	U	Yes
4,4'-DDT	0.79	ug/kg	1	-	U	Yes
Endrin	0.79	ug/kg	1	-	U	Yes
Endosulfan sulfate	0.79	ug/kg	1	-	U	Yes
Endrin aldehyde	0.79	ug/kg	1	-	U	Yes
Endosulfan-I	0.79	ug/kg	1	-	U	Yes
Endosulfan-II	0.79	ug/kg	1	-	U	Yes
Heptachlor	0.79	ug/kg	1	-	U	Yes
Heptachlor epoxide	0.79	ug/kg	1	-	U	Yes
Methoxychlor	1.6	ug/kg	1	-	U	Yes
Endrin ketone	0.79	ug/kg	1	-	U	Yes
Toxaphene	20	ug/kg	1	-	U	Yes

DATA REVIEW WORKSHEETS

Project/Case Number:_____JC20768___
Sampling Date:____May_19-20,_2016__
Shipping Date:____May_20,_2016_____
EPA Region No.:_____2_____

REVIEW OF PESTICIDE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence *Hazardous Waste Support Section SOP No. HW-36A, Revision 0, June, 2015. SOM02.2. Pesticide Data Validation.* The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: __JC20768_____ Sample matrix: _____Soil_____
No. of Samples: _____2_____

Trip blank No.: _____-_____
Field blank No.: _____-_____
Equipment blank No.:_____-_____
Field duplicate No.:_____-_____
Field spikes No.:_____-_____
QC audit samples:_____-_____

___X___ Data Completeness
___X___ Holding Times
__N/A__ GC/MS Tuning
___X__ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
__X____ Laboratory Control Spikes
__X____ Field Duplicates
__X____ Calibrations
__X____ Compound Identifications
__X____ Compound Quantitation
__X____ Quantitation Limits

Overall Comments:__TCL_pesticides_list_by_SW846-8081B_____
_____

Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:__June_17,_2016_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE EXTRACTED/ANALYZED	ACTION
Samples properly preserved.			

Preservatives: All samples extracted and analyzed within the required criteria.

Criteria

Aqueous samples - seven (7) days from sample collection for extraction; 40 days from sample collection for analysis.
Non-aqueous samples – fourteen (14) days from sample collection for extraction; 40 days from sample collection for analysis.

Cooler temperature (Criteria: 4 ± 2 °C): 5.8°C - OK

Actions

Qualify aqueous sample results using preservation and technical holding time information as follows:

a. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed within the technical holding times, qualify detects as estimated (J) and non-detects as estimated (UJ).

b. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed outside the technical holding times, qualify detects as estimated (J) and non-detects as estimated (UJ).

c. If the samples were properly preserved, and were extracted and analyzed within the technical holding times, no qualification of the data is necessary.

d. If the samples were properly preserved, and were extracted or analyzed outside the technical holding times, qualify detects as estimated (J) and non-detects as estimated (UJ). Note in the Data Review Narrative that holding times were exceeded and the effect of exceeding the holding time on the resulting data.

e. Use professional judgment to qualify samples whose temperature upon receipt at the laboratory is either below 2 degrees centigrade or above 6 degrees centigrade.
f. If technical holding times are grossly exceeded, use professional judgment to qualify the data.

Qualify non-aqueous sample results using preservation and technical holding time information as follows:
a. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed within the technical holding time, qualify detects as estimated (J) and non-detects as estimated (UJ).
b. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed outside the technical holding time, qualify detects as estimated (J) and non-detects as estimated (UJ).
c. If the samples were properly preserved, and were extracted and analyzed within the technical holding time, no qualification of the data is necessary.
d. If the samples were properly preserved, and were extracted or analyzed outside the technical holding time, qualify detects as estimated (J) and non-detects as estimated (UJ). Note in the Data Review Narrative that holding times were exceeded and the effect of exceeding the holding time on the resulting data.
e. Use professional judgment to qualify samples whose temperature upon receipt at the laboratory is either below 2 degrees centigrade or above 6 degrees centigrade.
f. If technical holding times are grossly exceeded, use professional judgment to qualify the data.

All criteria were met __X__
Criteria were not met see below ____

GAS CHROMATOGRAPH WITH ELECTRON CAPTURE DETECTOR (GC/ECD) INSTRUMENT PERFORMANCE CHECK (SECTIONS 1 TO 5)

1. Resolution Check Mixture

Criteria

Is the resolution between two adjacent peaks in the Resolution Check Mixture C greater than or equal to 80.0% for all analytes for the primary column and greater than or equal to 50.0% for the confirmation column? **Yes**? or No?

Is the resolution between two adjacent peaks in the Resolution Check Mixture (A and B) greater than or equal to 60.0%? Yes? or No?

Note: If resolution criteria are not met, the quantitative results may not be accurate due to inadequate resolution. Qualitative identifications may also be questionable if coelution exists.

Action

a. Qualify detects for target compounds that were not adequately resolved as tentatively identified (NJ).
b. Qualify non-detected compounds as unusable (R).

2. Performance Evaluation Mixture (PEM) Resolution Criteria

Criteria

Is PEM analysis performed at the required frequency (at the end of each pesticide initial calibration sequence and every 12 hours)? **Yes**? or No?

Action

a. If PEM is not performed at the required frequency, qualify all associated sample and blank results as unusable (R).

Criteria

Is PEM % Resolution < 90%? Yes? or **No?**

Action

a. a. Qualify detects for target compounds that were not adequately resolved as tentatively identified (NJ).
b. Qualify non-detected compounds as unusable (R).

All criteria were met ___X___
Criteria were not met see below ____

3. PEM 4,4'-DDT Breakdown

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is detected? Yes? or **No**?

Action

a. Qualify detects for 4,4'-DDT; detects for 4,4'-DDD; and detects for 4,4'-DDE as estimated (J)

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is not detected Yes? or **No**?

Action

a. Qualify non-detects for 4,4'- DDT as unusable (R)
b. Qualify detects for 4,4'-DDD as tentatively identified (NJ)
c. Qualify detects for 4,4'-DDE as tentatively identified (NJ)

4. PEM Endrin Breakdown

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is detected? Yes? or **No**?

Action

a. Qualify detects for Endrin; detects for Endrin aldehyde; and detects for Endrin ketone as estimated (J)

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is not detected Yes? or **No**?

Action

a. Qualify non-detects for Endrin as unusable (R)
b. Qualify detects for Endrin aldehyde as tentatively identified (NJ)
c. Qualify detects for Endrin ketone as tentatively identified (NJ)

All criteria were met ___X___
Criteria were not met see below _____

5. Mid-point Individual Standard Mixture Resolution -

Criteria

Is the resolution between two adjacent peaks in the Resolution Check Mixture C greater than or equal to 80.0% for all analytes for the primary column and greater than or equal to 50.0% for the confirmation column? **Yes**? or No?

Is the resolution between two adjacent peaks in the Resolution Check Mixture (A and B) greater than or equal to 90.0%? **Yes**? or No?

Note: If resolution criteria are not met, the quantitative results may not be accurate due to inadequate resolution. Qualitative identifications may also be questionable if coelution exists.

Action

a. Qualify detects for target compounds that were not adequately resolved as tentatively identified (NJ).
b. Qualify non-detected compounds as unusable (R).

Criteria

Is mid-point individual standard mixture analysis performed at the required frequency (every 12 hours)? **Yes**? or No?

Action

a. If the mid-point individual standard mixture analysis is not performed at the required frequency, qualify all associated sample and blank results as unusable (R).

All criteria were met __X____
Criteria were not met
and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:	05/16/16	04/14/16
Dates of initial calibration verification:	05/16/16	04/14/16
Dates of continuing calibration:	05/25/16; 05/26/16	05/24/16
Dates of final calibration	05/25/16; 05/26/16	05/25/16
Instrument ID numbers:	GC1G	HP_G1530A
Matrix/Level:	Aqueous/low	Aqueous/low

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
HP G1530A				
05/25/16	cc987-25	37.6/39.2	4,4'-DDT	JC20768-4; -5
		33.9/34.7	Methoxychlor	
Initial and initial calibration verification within the guidance document performance criteria. Continuing calibration % differences meet the performance criteria in at least one of the two columns. Final calibration verification included in data. % differences meet the performance criteria in at least one of the two columns package except in the cases described in this document. No action taken, professional judgment.				

Criteria

Are a five point calibration curve delivered with concentration levels as shown in Table 3 of SOP HW-36A, Revision 0, June, 2015? **Yes**? or No?

Actions

If the standard concentrations listed in Table 3 are not used, use professional judgment to evaluate the effect on the data

Criteria

Are RT Windows calculated correctly? **Yes**? or No?

Action

Recalculate the windows and use the corrected values for all evaluations.

Criteria

Are the Percent Relative Standard Deviation (%RSD) of the CFs for each of the single component target compounds less than or equal to 20.0%, except for alpha-BHC and delta-BHC?

Yes? or No?

Are the %RSD of the CFs for alpha-BHC and delta-BHC less than or equal to 25.0%. Yes? or No?

Is the %RSD of the CFs for each of the Toxaphene peaks must be < 30% when 5-point ICAL is performed? Yes? or No?

Is the %RSD of the CFs for the two surrogates (tetrachloro-m-xylene and decachlorobiphenyl) less than or equal to 30.0%. Yes? or No?

Action

a. If the %RSD criteria are not met, qualify detects as estimated (J) and use professional judgment to qualify non-detected target compounds.
b. If the %RSD criteria are within allowable limits, no qualification of the data is necessary

Continuing Calibration Checks

Criteria

Is the continuing calibration standard analyzed at the acceptable time intervals? Yes? or No?

Action

a. If more than 14 hours has elapsed from the injection of the instrument blank that begins an analytical sequence (opening CCV) and the injection of either a PEM or mid-point concentration of the Individual Standard Mixtures (A and B) or (C), qualify all data as unusable (R).
b. If more than 12 hours has elapsed from the injection of the instrument blank that begins an analytical sequence (opening CCV) and the injection of the last sample or blank that is part of the same analytical sequence, qualify all data as unusable (R).
c. If more than 72 hours has elapsed from the injection of the sample with a Toxaphene detection and the Toxaphene Calibration Verification Standard (CS3), qualify all data as unusable (R).

Criteria

Is the Percent Difference (%D) within ±25.0% for the PEM sample? Yes? or No?

Action
a. Qualify associated detects as estimated (J) and non-detects as estimated (UJ).

Criteria

For the Calibration Verification Standard (CS3); is the Percent Difference (%D) within ±25.0%?
Yes? or No?

Action

Qualify associated detects as estimated (J) and non-detects as estimated (UJ).

All criteria were met __X__
Criteria were not met
and/or see below _____

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is detected? Yes? or **No**?

Action

a. Qualify detects for 4,4'-DDT; detects for 4,4'-DDD; and detects for 4,4'-DDE as estimated (J)
b. Non-detected associated compounds are not qualified

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is not detected Yes? or **No**?

Action

a. Qualify non-detects for 4,4'- DDT as unusable (R)
b. Qualify detects for 4,4'-DDD as tentatively identified (NJ)
c. Qualify detects for 4,4'-DDE as tentatively identified (NJ)

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is detected? Yes? or **No**?

Action

a. Qualify detects for Endrin; detects for Endrin aldehyde; and detects for Endrin ketone as estimated (J)
b. Non-detected associated compounds are not qualified

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is not detected Yes? or **No**?

Action

a. Qualify non-detects for Endrin as unusable (R)
b. Qualify detects for Endrin aldehyde as tentatively identified (NJ)
c. Qualify detects for Endrin ketone as tentatively identified (NJ)

A separate worksheet should be filled for each initial curve

All criteria were met __X__
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

CRQL concentration_____N/A_____

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
No target analytes detected in method blanks at a reporting limit of 0.01 and 0.001 ug/L.				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
No field/trip/equipment blanks analyzed with this data package.				

All criteria were met __X__
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

The concentration of non-target compounds in all blanks must be less than or equal to 10 µg/L. The concentration of each target compound found in the method or field blanks must be less than its CRQL listed in the method.

Data concerning the field blanks are not evaluated as part of the CCS process. If field blanks are present, the data reviewer should evaluate this data in a similar fashion as the method blanks.

Specific actions are as follows:

Blank Actions for Pesticide Analyses

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Sulfur Cleanup, Instrument, Field, TCLP/SPLP	Detects	Not detected	No qualification required
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and ≤ blank concentration	Report blank value for sample concentration with a U
		≥ CRQL and > blank concentration	No qualification required
	= CRQL	≤ CRQL	Report CRQL value with a U
		> CRQL	No qualification required
	Gross contamination	Detects	Report blank value for sample concentration with a U

All criteria were met __X__
Criteria were not met
and/or see below _____

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met __X__
Criteria were not met
and/or see below ____

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.

Matrix:_Soil_____

Lab Sample ID	Lab File ID	S1 a	S1 b	S2 a	S2 b
JC20768-4	6G35483.D	81	88	80	94
JC20768-5	6G35484.D	89	98	75	97
OP94185-BS1	6G35479.D	75	75	80	90
OP94185-MB1	6G35478.D	103	103	113	124
OP94185-MB1	1G123526.D	98	101	105	118
OP94185-MB1	1G123571.D	121	110	120	124
OP94185-MS	6G35481.D	87	85	83	101
OP94185-MSD	6G35482.D	89	87	83	102

Surrogate Compounds	Recovery Limits
S1 = Tetrachloro-m-xylene	26-132%
S2 = Decachlorobiphenyl	10-118%

(a) Recovery from GC signal #1
(b) Recovery from GC signal #2

Note: Surrogate recoveries within laboratory control limits.

Actions:

a. For any surrogate recovery greater than 150%, qualify detected target compounds as biased high (J+).
b. Do not qualify non-detected target compounds for surrogate recovery > 150 %.
c. If both surrogate recoveries are greater than or equal to 30% and less than or equal to 150%, no qualification of the data is necessary.
d. For any surrogate recovery greater than or equal to 10% and less than 30%, qualify detected target compounds as biased low (J-).
e. For any surrogate recovery greater than or equal to 10% and less than 30%, qualify non-detected target compounds as approximated (UJ).

f. If low surrogate recoveries are from sample dilution, professional judgment should be used to determine if the resulting data should be qualified. If sample dilution is not a factor:

i. Qualify detected target compounds as biased low (J-).

ii. Qualify non-detected target compounds as unusable (R).

g. If surrogate RTs in PEMs, Individual Standard Mixtures, samples, and blanks are outside of the RT Windows, the reviewer must use professional judgment to qualify data.

h. If surrogate RTs are within RT windows, no qualification of the data is necessary.

i. If the two surrogates were not added to all samples, MS/MSDs, standards, LCSs, and blanks, use professional judgment in qualifying data as missing surrogate analyte may not directly apply to target analytes.

Summary Surrogate Actions for Pesticide Analyses

Criteria	Action*	
	Detected Target Compounds	Non-detected Target Compounds
%R > 150%	J+	No qualification
30% < %R < 150%	No qualification	
10% < %R < 30%	J-	UJ
%R < 10% (sample dilution not a factor)	J-	R
%R < 10% (sample dilution is a factor)	Use professional judgment	
RT out of RT window	Use professional judgment	
RT within RT window	No qualification	

* Use professional judgment in qualifying data, as surrogate recovery problems may not directly apply to target analytes.

All criteria were met ___X___
Criteria were not met
and/or see below _____

MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

Data for MS and MSDs will not be present unless requested by the Region.
Notify the Contract Laboratory Program Project Officer (CLP PO) if a field blank was used for the MS and MSD, unless designated as such by the Region.

> **NOTE:** For a Matrix Spike that does not meet criteria, apply the action to only the field sample used to prepare the Matrix Spike sample. If it is clearly stated in the data validation materials that the samples were taken through incremental sampling or some other method guaranteeing the homogeneity of the sample group, then the entire sample group may be qualified.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:____JC20582-3_____ Matrix/Level:____Soil_____

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION
_MSD_____	alpha-chlordane_____	-5_%	_____	15_-_151_____	No_action_____
_MSD_____	gamma-chlordane___	-_5_%	_____	13_-_151_____	No_action_____
_MS/MSD_____	dieldrin_____	-97/-54_%	_____	10_-157_____	No_ation_____

Note: No action taken, high level of the anlytes in sample relative to amount spiked.

Action

No qualification of the data is necessary on MS and MSD data alone. However, using professional judgment, the validator may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

LCS Spike Compound	Recovery Limits (%)
gamma-BHC	50 – 120
Heptachlor epoxide	50 – 150
Dieldrin	30 – 130
4,4'-DDE	50 – 150
Endrin	50 – 120
Endosulfan sulfate	50 – 120
trans-Chlordane	30 – 130
Tetrachloro-m-xylene (surrogate)	30 – 150
Decachlorobiphenyl (surrogate)	30 – 150

LCS concentrations:____16.7_ug/kg_____

List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT

Action

The following guidance is suggested for qualifying sample data for which the associated LCS does not meet the required criteria.

a. If the LCS recovery exceeds the upper acceptance limit, qualify detected target compounds as estimated (J). Do not qualify non-detected target compounds.

b. If the LCS recovery is less than the lower acceptance limit, qualify detected target compounds as estimated (J) and non-detects as unusable (R).

c. Use professional judgment to qualify data for compounds other than those compounds that are included in the LCS.

d. Use professional judgment to qualify non-LCS compounds. Take into account the compound class, compound recovery efficiency, analytical problems associated with each compound, and comparability in the performance of the LCS compound to the non-LCS compound.

e. If the LCS recovery is within allowable limits, no qualification of the data is necessary.

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

Note: Blank spike/blank spike duplicate analyzed for aqueous matrices. % recoveries and RPD within laboratory control limits.

All criteria were met _____
Criteria were not met
and/or see below __N/A____

FLORISIL CARTRIDGE PERFORMANCE CHECK

NOTE: Florisil cartridge cleanup is mandatory for all extracts.

Criteria

Is the Florisil cartridge performance check conducted at least once on each lot of cartridges used for sample cleanup or every 6 months, whichever is most frequent? Yes? or No?

Criteria

Are the results for the Florisil Cartridge Performance Check solution included with the data package? Yes? or No?

Note: If % criteria are not met, examine the raw data for the presence of polar interferences and use professional judgment in qualifying the data as follows:

Action:

a. If the Percent Recovery is greater than 120% for any of the pesticide target compounds in the Florisil Cartridge Performance Check, qualify detected compounds as estimated (J). Do not qualify non-detected target compounds.
b. If the Percent Recovery is greater than or equal to 80% and less than or equal to 120% for all the pesticide target compounds, no qualification of the data is necessary.
c. If the Percent Recovery is greater than or equal to 10% and less than 80% for any of the pesticide target compounds in the Florisil Cartridge Performance Check, qualify detected target compounds as estimated (J) and non-detected target compounds as approximated (UJ).
d. If the Percent Recovery is less than 10% for any of the pesticide target compounds in the Florisil Cartridge Performance Check, qualify detected compounds as estimated (J) and qualify non-detected target compounds as unusable (R).
e. If the Percent Recovery of 2,4,5-trichlorophenol in the Florisil Cartridge Performance Check is greater than or equal to 5%, use professional judgment to qualify detected and non-detected target compounds, considering interference on the sample chromatogram.

Note: State in the Data Review Narrative potential effects on the sample data resulting from the Florisil Cartridge Performance Check analysis not yielding acceptable results.

Note:_ No information for florisil cartridge performance check included in data package. There is evidence that Florisil cartridge was used for sample extraction/clean-up. No qualification of the data performed, professional judgment.

All criteria were met __N/A____
Criteria were not met
and/or see below _____

GEL PERMEATION CHROMATOGRAPHY (GPC) PERFORMANCE CHECK

NOTE: GPC cleanup is mandatory for all soil samples.

If GPC criteria are not met, examine the raw data for the presence of high molecular weight contaminants; examine subsequent sample data for unusual peaks; and use professional judgment in qualifying the data. Notify the Contract Laboratory Program Project Officer (CLP PO) if the laboratory chooses to analyze samples under unacceptable GPC criteria.

Action:

a. If the Percent Recovery is less than 10% for the pesticide compounds and surrogates during the GPC calibration check, the non-detected target compounds may be suspect, qualify detected compounds as estimated (J).
b. If the Percent Recovery is less than 10% for the pesticide compounds and surrogates during the GPC calibration check, qualify all non-detected target compounds as unusable (R).
c. If the Percent Recovery is greater than or equal to 10% and is less than 80% for any of the pesticide target compounds in the GPC calibration, qualify detected target compounds as estimated (J) and non-detected target compounds as approximated (UJ).
d. If the Percent Recovery is greater than or equal to 80% and less than or equal to 120% for all the pesticide target compounds, no qualification of the data is necessary.
e. If high recoveries (i.e., greater than 120%) were obtained for the pesticides and surrogates during the GPC calibration check, qualify detected compounds as estimated (J). Do not qualify non-detected target compounds.

Note: State in the Data Review Narrative potential effects on the sample data resulting from the GPC cleanup analyses not yielding acceptable results.

Note:_ No information for performance of GPC cleanup included in data package. No qualification of the data performed, professional judgment.

All criteria were met __X__
Criteria were not met
and/or see below _____

TARGET COMPOUND IDENTIFICATION

Criteria:

1. Is Retention Times (RTs) of both of the surrogates and reported target compounds in each sample within the calculated RT Windows on both columns? **Yes**? or No?

2. Is the Tetrachloro-m-xylene (TCX) RT ±0.05 minutes of the Mean RT (RT) determined from the initial calibration and Decachlorobiphenyl (DCB) within ±0.10 minutes of the RT determined from the initial calibration? **Yes**? or No?

3. Is the Percent Difference (%D) for the detected mean concentrations of a pesticide target compound between the two Gas Chromatograph (GC) columns within the inclusive range of ± 25.0 %? **Yes**? or No?

4. When no analytes are identified in a sample; are the chromatograms from the analyses of the sample extract and the low-point standard of the initial calibration associated with those analyses on the same scaling factor? **Yes**? or No?

5. Does the chromatograms display the Single Component Pesticides (SCPs) detected in the sample and the largest peak of any multi-component analyte detected in the sample at less than full scale. Yes? or **No**?

6. If an extract is diluted; does the chromatogram display SCPs peaks between 10-100% of full scale, and multi-component analytes between 25-100% of full scale? Yes? or No?

7. For any sample; does the baseline of the chromatogram return to below 50% of full scale before the elution time of alpha-BHC, and also return to below 25% of full scale after the elution time of alpha-BHC and before the elution time of DCB? **Yes**? or No?

8. If a chromatogram is replotted electronically to meet these requirements; is the scaling factor used displayed on the chromatogram, and both the initial chromatogram and the replotted chromatogram submitted in the data package. Yes? or **No**?

Action:

a. If the qualitative criteria for both columns were not met, all target compounds that are reported as detected should be considered non-detected.

b. Use professional judgment to assign an appropriate quantitation limit using the following guidance:

i. If the detected target compound peak was sufficiently outside the pesticide RT Window, the reported values may be a false positive and should be replaced with the sample Contract Required Quantitation Limits (CRQL) value.

ii. If the detected target compound peak poses an interference with potential detection of another target peak, the reported value should be considered and qualified as unusable (R).

c. If the data reviewer identifies a peak in both GC column analyses that falls within the appropriate RT Windows, but was reported as a non-detect, the compound may be a false negative. Use professional judgment to decide if the compound should be included.

Note: State in the Data Review Narrative all conclusions made regarding target compound identification.

d. If the Toxaphene peak RT windows determined from the calibration overlap with SCPs or chromatographic interferences, use professional judgment to qualify the data.

e. If target compounds were detected on both GC columns, and the Percent Difference between the two results is greater than 25.0%, consider the potential for coelution and use professional judgment to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interfering compound is indicated, use professional judgment to determine how best to report, and if necessary, qualify the data according to these guidelines.

f. If Toxaphene exhibits a marginal pattern-matching quality, use professional judgment to establish whether the differences are due to environmental "weathering" (i.e., degradation of the earlier eluting peaks relative to the later eluting peaks). If the presence of Toxaphene is strongly suggested, report results as presumptively present (N).

GAS CHROMATOGRAPH/MASS SPECTROMETER (GC/MS) CONFIRMATION

NOTE: This confirmation is not usually provided by the laboratory. In cases where it is provided, use professional judgment to determine if data qualified with "C" can be salvaged if it was previously qualified as unusable (R).

Action:

a. If the quantitative criteria for both columns were met (≥ 5.0 ng/µL for SCPs and ≥ 125 ng/µL for Toxaphene), determine whether GC/MS confirmation was performed. If it was performed, qualify the data using the following guidance:

i. If GC/MS confirmation was not required because the quantitative criteria for both columns was not met, but it was still performed, use professional judgment when evaluating the data to decide whether the detect should be qualified with "C".

ii. If GC/MS confirmation was performed, but unsuccessful for a target compound detected by GC/ECD analysis, qualify those detects as "X".

All criteria were met ___X___
Criteria were not met
and/or see below _____

COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JC20768-1 Tetrachloro-m-xylene RF = 0.916

[ ] = $(106.1 \times 10^6)(50)/(179.5 \times 10^6)(0.916)$
= 32.3 ppb Ok

Action:

a. If sample quantitation is different from the reported value, qualify result as unusable (R).
b. When a sample is analyzed at more than one dilution, the lowest CRQLs are used unless a QC exceedance dictates the use of the higher CRQLs from the diluted sample.
c. Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and its corresponding value on the original reporting form and substituting the data from the diluted sample.
d. Results between the MDL and CRQL should be qualified as estimated (J).
e. Results less than the MDL should be reported at the CRQL and qualified (U). MDLs themselves are not reported.
f. For non-aqueous samples, if the percent moisture is less than 70.0%, no qualification of the data is necessary. If the percent moisture is greater than or equal to 70.0% and less than 90.0%, qualify detects as estimated (J) and non-detects as approximated (UJ). If the percent moisture is greater than or equal to 90.0%, qualify detects as estimated (J) and non-detects as unusable (R) (see Table).

Percent Moisture Actions for Pesticide Analysis for Non-Aqueous Samples

Criteria	Action	
	Detected Associated Compounds	**Non-detected Associated Compounds**
% Moisture < 70.0	No qualification	
70.0 < % Moisture < 90.0	J	UJ
% Moisture > 90.0	J	R

List samples which have ≤ 50 % solids

Note: If any discrepancies are found, the Region's designated representative may contact the laboratory to obtain additional information that could resolve any differences. If a discrepancy remains unresolved, the reviewer must use professional judgment to decide which value is the most accurate. Under these circumstances, the reviewer may determine that qualification of data is warranted. Note in the Data Review Narrative a description of the reasons for data qualification and the qualification that is applied to the data.

Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

All criteria were met __N/A__
Criteria were not met
and/or see below _____

FIELD DUPLICATE PRECISION

NOTE: In the absence of QAPP guidance for validating data from field duplicates, the following action will be taken.

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples. Identify which samples within the data package are field duplicates. Estimate the relative percent difference (RPD) between the values for each compound. If large RPDs (> 50%) is observed, confirm identification of samples and note difference in the executive summary.

Sample IDs: _____-_____ Matrix:_____-_____

COMPOUND	SQL ug/L	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
No field/laboratory duplicate analyzed with this data package. LCS/LCSD % recoveries RPD used to assess precision. RPD within the required criteria of < 50 %.					

Actions:

a. Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

b. If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

i. If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

ii. If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

iii. If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

iv. If both sample and duplicate results are not detected, no action is needed.

OVERALL ASSESSMENT OF DATA

Action:
1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.

2. Write a brief narrative to give the user an indication of the analytical limitations of the data.

Note: The Contract Laboratory Program Project Officer (CLP PO) must be informed if any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).

Overall assessment of the data: Results are valid; the data can be used for decision making purposes.